

ANNOUNCEMENTS 1964-65



NORTH CENTRAL REGION **Barker Memorial Center**

Michigan City

PURDUE UNIVERSITY BULLETIN

UNIVERSITY CALENDAR

1964

SEPTEMBER							NOVEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4	5						
6	7	8	9	10	11	12	8	9	10	11	12	13	14
13	14	15	16	17	18	19	15	16	17	18	19	20	21
20	21	22	23	24	25	26	22	23	24	25	26	27	28
27	28	29	30				29	30					
OCTOBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3			1	2	3	4	5	
4	5	6	7	8	9	10	6	7	8	9	10	11	12
11	12	13	14	15	16	17	13	14	15	16	17	18	19
18	19	20	21	22	23	24	20	21	22	23	24	25	26
25	26	27	28	29	30	31	27	28	29	30	31		

1965

JANUARY							MAY						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2				1					
3	4	5	6	7	8	9	2	3	4	5	6	7	8
10	11	12	13	14	15	16	9	10	11	12	13	14	15
17	18	19	20	21	22	23	16	17	18	19	20	21	22
24	25	26	27	28	29	30	23	24	25	26	27	28	29
31							30	31					
FEBRUARY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6		1	2	3	4	5	
7	8	9	10	11	12	13	6	7	8	9	10	11	12
14	15	16	17	18	19	20	13	14	15	16	17	18	19
21	22	23	24	25	26	27	20	21	22	23	24	25	26
28							27	28	29	30			
MARCH							JULY						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6		1	2	3	4	5	
7	8	9	10	11	12	13	4	5	6	7	8	9	10
14	15	16	17	18	19	20	11	12	13	14	15	16	17
21	22	23	24	25	26	27	18	19	20	21	22	23	24
28	29	30	31				25	26	27	28	29	30	31
APRIL							AUGUST						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6		1	2	3	4	5	6
4	5	6	7	8	9	10	8	9	10	11	12	13	14
11	12	13	14	15	16	17	15	16	17	18	19	20	21
18	19	20	21	22	23	24	22	23	24	25	26	27	28
25	26	27	28	29	30		29	30	31				

PURDUE UNIVERSITY BULLETIN

Volume 64

March 16, 1964

Number 16

Second class postage paid at Lafayette, Indiana. Issued by Purdue University 26 times a year: three times each in January, February, March, April, May, June, and December; once each in July, August, September, October, and November.

First Semester

September 16

Classes begin

November 25

Thanksgiving vacation begins

November 30

Classes resume

December 19

Christmas vacation begins

January 4

Classes resume

January 23

Classes end

Second Semester

February 1

Classes begin

March 27

Spring vacation begins

April 5

Classes resume

June 2

Classes end

June 6

Commencement

Summer Sessions, 1965

June 21-August 13

Regular 8-Week Session

July 5

Independence Day Holiday

June 14-July 2

First Intensive Session

July 6-23

Second Intensive Session

July 26-August 13

Third Intensive Session

Michigan City Center

NORTH CENTRAL REGION

Announcements for the Year 1964-65

PURDUE UNIVERSITY

LAFAYETTE, INDIANA



Ninetieth Year

PUBLISHED BY THE UNIVERSITY

again he will be compelled

to do the same again.

Finally, we can see that

affection is often

the result of

the action of the

other



and affection is often

the result of the action of the other.

CONTENTS

Officers of Administration and Instruction.....	4
Admission	5
Scholarship Indexes	9
Abbreviations	13
Plans of Study	
Engineering	14
Applied Technology	19
Humanities, Social Science, and Education.....	26
Science	31
Industrial Management	34
Agriculture	34
Home Economics	37
Description of Courses	38
Administrative and Instructional Staff	50
Index	51

PURDUE UNIVERSITY

Division of University Centers

Lafayette, Indiana

OFFICERS OF ADMINISTRATION AND INSTRUCTION

Administrative Officers

FREDERICK L. HOVDE, B.Ch.E., M.A., D.Sc., LL.D., D. Eng., D.H.L., D.C.L.	President
LYTLE J. FREEHAFER, A.B.	Vice President and Treasurer
DONALD R. MALLETT, Ph.D.	Vice President and Executive Dean
PAUL F. CHENEA, Ph.D.	Vice President for Academic Affairs
FREDERICK N. ANDREWS, Ph.D., D.Sc.	Vice President for Research and Dean of the Graduate School

University Extension Administration

C. H. LAWSHE, Ph.D.	Dean of University Extension
G. W. McNELLY, Ph.D.	Director of Applied Technology
M. M. MICHELS, Ph.D.	Assistant Dean of University Extension
N. M. PARKHURST, M.S.	Registrar
H. C. ROUNTREE, B.S.	Head, Department of Engineering Technology
C. L. DARBY, Ph.D.	Assistant to the Dean of University Extension
D. A. SCOTT, Ph.D.	Associate Dean of University Extension
H. W. WHITE, M.S.	Director of Admissions
B. J. PERSHING	Assistant Comptroller

Barker Memorial Center (Michigan City) Administrative Staff

R. F. SCHWARZ, M.S.	Director
R. E. WILSON, Ed.D.	Assistant Director

GENERAL INFORMATION

Admission

All inquiries regarding admission to Purdue University as well as requests for application forms should be addressed to the Admissions Office of the campus or center at which the applicant wishes to enroll. The application should be filled out according to the instructions on the form and submitted to the high school from which the individual graduated. The high school will complete the application and forward it to the campus or center indicated by the student. Prospective students should make application during the seventh semester of high school. This enables the University to notify the applicants of tentative action before they graduate.

Acceptance for admission will depend upon three factors: subject matter requirements, class standing, and College Board examination results.

1. Subject Matter Requirements. All areas of specialization at Purdue require one unit of algebra, one unit of plane geometry, one unit of laboratory science, three units of English, a unit of social studies, three additional units of one or more of these subjects mentioned; a total of not less than 15 units; and finally high school graduation. In addition, the Schools of Engineering require one half unit of advanced algebra and one half unit of trigonometry, and the School of Industrial Management requires one half unit of advanced algebra. The De-

School, Division, or Department	High School Graduation	1 Unit Algebra	½ Unit Advanced Algebra	1 Unit Plane Geometry	½ Unit Trigonometry	1 Unit Laboratory Science	3 Units English	1 Unit Social Studies	Total of Not Less Than 15 Units
Agriculture and Forestry	x	x		x		x	x	x	x
Applied Technology (2 yrs.)	x	x		x		x	x	x	x
Engineering	x	x	x	x	x	x	x	x	x
Home Economics	x	x		x		x	x	x	x
Humanities, Social Science, and Education	x	x		x		x	x	x	x
Industrial Education	x	x		x		x	x	x	x
Industrial Management	x	x	x	x		x	x	x	x
Physical Education (Men)	x					x	x	x	x
Science*	x	x		x		x	x	x	x
Veterinary Science and Medicine									
									2 years of preveterinary curriculum

* Includes prepharmacy.

6 / ADMISSION

partment of Physical Education for Men does not require units in algebra and plane geometry.

High school students who desire to take engineering and who expect to get the degree in eight semesters under the regular engineering curriculum should obtain credit in the following high school subjects in addition to the minimum requirements listed above: a fourth semester of algebra and a full unit of both physics and chemistry.

2. **Class Standing.** Preference is given to applicants in the upper half of their high school graduating class. Students ranking in the lower half of their graduating classes (lowest third if application is for School of Agriculture or Division of Applied Technology) will be considered as special cases. On the basis of examination results, high school record, and any other pertinent information, one of the following actions may be taken:
 - a. Granted unqualified admission.
 - b. Admitted on one-semester probation.
 - c. Admission postponed until an adequate academic background can be demonstrated.
3. **College Entrance Examination Board Tests:** All applicants who have not completed a full year of college work are *required* to take both the Scholastic Aptitude Test (SAT) and Achievement sections of the College Entrance Examination Board. Results of the Achievement tests in English, mathematics, and chemistry are required, except that a student who has not had or is not taking chemistry may substitute the test for the science area which he has studied. Students who have had three years or less of mathematics should take the intermediate mathematics achievement test; those who have had more than three years should take the advanced mathematics test.

Nonresident Admission

Out-of-state applicants must rank in the top half of their graduating class or in the top half of the College Board examinations to qualify for admission. Such applicants who are qualified will be considered in numbers consistent with the facilities of the University campus concerned. The individual campus or center reserves the right to alter admission requirements for this group as the situation requires.

Transfer Students

An applicant transferring from another college or university must fulfill the following requirements:

1. Submit an application for admission on the prescribed form through the high school from which he was graduated.
2. Forward an official transcript of work done in institutions previously attended.
3. Have earned an average of at least one letter grade higher than the passing grade for all courses previously taken at a recognized college or university.
4. Provide the completed application, including all items specified above, prior to a deadline established by the admissions officer.

Temporary Students

Persons who desire to take advantage of the instruction offered in any of the departments of the University without undertaking one of the regular plans of study and without becoming a candidate for a degree may be admitted as temporary students. Such students must present satisfactory evidence that they are prepared to undertake the work desired. The registration of a temporary student will be restricted to the academic year, or the part of it, for which admission is granted, and will be terminated with the beginning of each new academic year unless a new application for admission as a temporary student is approved. Application for admission as a temporary student should be made to the Admissions Office of the campus or center involved. Temporary students are expected to maintain a grade-point average equivalent to regular students as outlined on pages 9, 10, and 11.

Registration

- a. Preregistration—Current students should preregister for fall, spring, and summer sessions at announced times. New students should preregister at the times specified by the admissions officer. Preregistration eliminates standing in line and assures preferential scheduling.
- b. For students who cannot preregister, a two-day registration period is held just prior to the beginning of classes. Consult the calendar on the inside front cover for dates.
- c. Late registration lasts one week, from the first day of class.

Dropping and Adding Courses

A student may add a course to his schedule only during the first week of class. To drop a course he should consult the fee refund schedule on the next page and the directed grades explanation on page 9.

University Fees

Since catalog copy is, of necessity, prepared several months in advance, fees are subject to change by the Board of Trustees without notice.

Course Fees. For courses numbered 100-499, \$15 per credit hour plus \$4 per laboratory hour. For courses numbered 500 and above, \$18 per credit hour plus \$4 per laboratory hour. This fee schedule may not necessarily apply to special programs.

Late Registration Fees. In addition to the regular course fees, students who register late must pay \$2 per course with a maximum of \$10 and a minimum of \$5 per student always to apply. This is currently effective at the Calumet Campus and Indianapolis Campus.

Breakage Fees. Course fees include the cost of normal breakage and wear and tear on equipment. An additional charge will be levied against individuals for excessive waste, loss, or breakage that may occur. Such special charges must be paid before course credit will be given.

Activity Fees. Students enrolled in 12 semester hours or more at the Calumet Campus, Indianapolis Campus, or Fort Wayne Center pay an activity fee of \$3 per semester. Students carrying 8-11 semester hours pay a \$2 activity fee and those carrying 1-7 hours pay \$1 per semester.

8 / GRADES

Special Examination Fees. By any student taking an examination to remove a condition—per course	\$ 5
For advanced credit for students who are currently registered for more than seven semester hours (four or more in a summer session)—per course	\$ 5
For advanced credit for students who are currently registered for seven hours or less (less than four in a summer session)—per course.....	\$25

Withdrawal. In order to effect a withdrawal from any class, a student must notify the campus or center office at the time of withdrawal. Discontinuance of class attendance is not the basis for withdrawal, and students who do not notify the office when they plan to withdraw will be given a failing grade in each course involved.

Refunds. Course fees will be refunded under any one of the following conditions:

1. Withdrawal during first and second weeks of semester, 80 per cent refund.
2. Withdrawal during third and fourth weeks of semester, 60 per cent refund.
3. Withdrawal during fifth and sixth weeks of semester, 40 per cent refund.
4. Withdrawal after sixth week of semester, no refund.
5. No refund in flight courses.

Students who register for a course and do not attend class will be withdrawn as of the first day of class and entitled to a refund of 80 per cent of the course fees paid.

Deposits on equipment are subject to regular service and breakage charges.

Refunds are not transferable from one registration period to another or from one student to another.

To be eligible for a refund the student must notify the extension office and apply for a refund at the center or campus where he is registered at the time of his withdrawal.

Insurance

Hospitalization insurance is available to students at a reduced rate. The Purdue student insurance can only be obtained at the beginning of the first and second semesters by making application at the business office. This insurance program provides hospitalization, surgical, and medical coverage for the student during the calendar year.

Grades

Instructors will assign each student a grade for each course in which he is enrolled at the close of a session. The student shall be responsible for the completion of all required work by the time of the last scheduled meeting in the course unless his assignment to the course has been properly cancelled. The grade shall indicate the student's achievement with respect to the objectives of the course.

For credit courses:

- A—highest passing grade.
- B
- C

D—lowest passing grade; passing minimal objectives of the course.

E—conditional failure; failure to achieve minimal objectives, but only to such limited extent that credit can be obtained by examination or otherwise without repeating the entire course. This grade represents failure in the course unless and until the record is duly changed within one semester. It cannot be changed to a grade higher than a D.

F—failure to achieve minimal objectives of the course. The student must repeat the course satisfactorily in order to establish credit in it.

For zero credit courses (including thesis research but not including laboratory portions of courses in which, for purposes of scheduling, separate course designations and separate class cards are used for the laboratory sections):

S—satisfactory; meets course objectives.

U—unsatisfactory; does not meet course objectives.

For incomplete work, either credit or noncredit:

O—incomplete; no grade; a temporary record of work which was interrupted by unavoidable absence or other causes beyond a student's control, and which work was passing at the time it was interrupted. An instructor may require the student to secure the recommendation of the dean of men or the dean of women that the circumstances warrant a grade of incomplete. On the record a grade of O will be equivalent to a W unless and until the record is duly changed within one semester.

Directed grades. The registrar is directed to record the following grades and symbols under special circumstances:

W—withdrew; a record of the fact that a student was enrolled in a course and withdrew or cancelled the course after the last date for late registration and adding courses.

WF—withdrew failing; a record of course cancellation after the last date for cancelling a course without grade, at which time, according to a statement from the instructor, the student was not passing in his work. This grade counts in all respects as a failing grade.

A grade of WF may be directed by the dean of men, the dean of women, or the Committee on Scholastic Delinquency and Readmission when a student is dropped from a course for serious scholastic delinquency.

Good Standing

For purposes of reports and communications to other institutions and agencies and in the absence of any further qualification of the term, a student shall be considered in good standing unless he has been dismissed, suspended, or dropped from the University and has not been readmitted.

SCHOLARSHIP INDEXES AND PROBATION STANDARDS

Scholarship Indexes

The scholastic standing of all regular students enrolled in programs leading to an undergraduate degree shall be determined by two scholarship indexes, the Semester Index and the Graduation Index.

10 / PROBATION

- (a) The Semester Index is an average determined by weighting each grade received during a given semester by the number of semester hours of credit in the course.
- (b) The Graduation Index is a weighted average of all grades received by a student while in the curriculum in which he is enrolled plus all other grades received in courses taken in other curricula offered by the University and properly accepted for satisfying the requirements of the curriculum of the school in which the student is enrolled. With the consent of his adviser, a student may repeat a course. In the case of courses which have been repeated or in which conditional grades have been removed by examination or for which a substantially equivalent course has been substituted, the most recent grade received shall be used.
- (c) For the purpose of averaging, each grade shall be weighted in the following manner:
 - A-6 x semester hours = index points
 - B-5 x semester hours = index points
 - C-4 x semester hours = index points
 - D-3 x semester hours = index points
 - E, F, WF 2 x semester hours = index points
 - O, W not included

Graduation Index Requirements

A minimum Graduation Index of 4.00 shall be required for graduation on and after September 1, 1965. Prior to September 1, 1965, the following schedule of minimum Graduation Indexes shall be required for graduation:

All students Graduating During	Minimum Graduation Index Required
Sept. 1, 1963-Aug. 31, 1964	3.90
Sept. 1, 1964-Aug. 31, 1965	3.95

Scholastic Probation

A candidate for the bachelor's or associate degree shall be placed on probation if his semester or graduation index at the end of any semester is less than that required for a student with his classification as shown in Table A. A student on probation shall be removed from that status at the end of the first subsequent semester in which he achieves semester and graduation indexes equal to or greater than those required for a student with his classification as shown in Table A. Any grade change due to a reporting error will require reconsideration of probation status.

Temporary students who do not achieve academic standing required of regular students may be discontinued. Probation is concerned only with the regular semesters and not with the summer sessions, summer camps, and intensive courses.

TABLE A. INDEX LEVELS FOR PROBATION
S = Semester Index; G = Graduation Index

Year	Sept. 1, 1963 to Aug. 31, 1964		Sept. 1, 1964 to Aug. 31, 1965		Sept. 1, 1965 and after	
	S	G	S	G	S	G
1	3.4	3.4	3.5	3.5	3.5	3.5
2	3.5	3.5	3.5	3.5	3.5	3.5
3	3.6	3.7	3.6	3.75	3.6	3.75
4	3.6	3.8	3.6	3.85	3.6	3.90
5	3.7	3.85	3.7	3.90	3.7	3.95
6	3.7	3.9	3.7	3.95	3.7	4.0
7	3.7	3.9	3.7	3.95	3.7	4.0
8 and up	3.7	3.9	3.7	3.95	3.7	4.0

Dropping of Students for Scholastic Deficiency

A student on scholastic probation shall be dropped from the University if at the close of any semester the semester or graduation index is less than that required of a student with his classification as shown in Table B. This rule shall not apply for the semester in which the student completes all requirements for his degree. A student who has been dropped may petition the Faculty Committee on Scholastic Delinquencies and Readmissions for readmission. If he is permitted to register again, he will do so on probation.

TABLE B. INDEX LEVELS FOR DROPPING
S = Semester Index; G = Graduation Index

Year	Sept. 1, 1963 to Aug. 31, 1964		Sept. 1, 1964 to Aug. 31, 1965		Sept. 1, 1965 and after	
	S	G	S	G	S	G
1*	3.2	3.2	3.2	3.2	3.2	3.2
2	3.3	3.3	3.3	3.3	3.3	3.3
3	3.4	3.5	3.4	3.5	3.4	3.5
4	3.4	3.55	3.4	3.6	3.4	3.6
5	3.5	3.65	3.5	3.7	3.5	3.7
6	3.5	3.7	3.5	3.75	3.5	3.8
7	3.5	3.75	3.5	3.80	3.5	3.85
8 and up	3.5	3.8	3.5	3.85	3.5	3.9

* Affects only students entering on probation.

Distinguished Students

Regular undergraduate students, carrying at least 14 semester hours, who successfully complete all their courses with a grade C or higher and obtain

12 / HONORS

a semester scholarship index of 5.50 or better will be designated as distinguished for that semester.

Degrees with Distinction

Degrees are awarded at the end of each semester and summer session to candidates who have completed the requirements of their schools. At each of these periods degrees with distinction are awarded to those completing the undergraduate plans of study under the following rules:

(a) Distinction at graduation shall be awarded on the basis of all course work taken. Baccalaureate degrees with distinction shall be granted only to those who complete the four (or five) year curricula at Purdue and not to those who complete only the first three years at Purdue.

(b) A candidate for the baccalaureate degree with distinction must have earned at least seventy hours of credit at Purdue. A candidate for an associate degree with distinction must have earned at least forty-five hours of credit at Purdue.

For any student to qualify for distinction, his scholarship index for all work completed must be at least 5.00.

(c) If the number of graduates in any school who qualify for distinction under rules (a) and (b) exceeds one-tenth of the total number of graduates from that school and for that semester or summer session, the number of degrees with distinction shall be limited to one-tenth of the class in that school, and those graduates with highest indexes shall be included. In administering this rule all baccalaureate engineering graduates will be considered as one school and all associate degree graduates will be considered as one school.

(d) Of those students who qualify for distinction under these rules, the three-tenths of the baccalaureate graduates having the highest indexes shall be designated as graduating with highest distinction, irrespective of the schools to which they may belong. The three-tenths of the associate degree graduates having the highest indexes will be designated as graduating with highest distinction.

(e) No student with a record of faculty discipline shall be included without special approval by the faculty.

Recognition of High Scholastic Attainment

A faculty committee is charged with the duty of recognizing students of superior ability and of assisting such students to receive the greatest possible benefits from their college careers.

High scholastic attainment is recognized by citation for distinguished scholarship. Those placed on the list of distinguished students, published after the close of each semester, are entitled to special privileges as follows:

Honor students of all classes are offered the opportunity to do work, for credit toward graduation, in addition to their regular schedule of studies. These additional assignments must have the approval of the head of the school involved. In order to make such additional work practicable the following special concessions may be granted:

1. Regular assignment of such additional subjects as the schedule will permit.

2. Assignments outside class under the supervision of an instructor.
3. Opportunities to gain credit in a subject by special examination.
4. Special arrangements as approved by the head of the school involved.
5. Some flexibility in the application of the system of prerequisites to these students.

Detailed reports of special arrangements under numbers 2 and 4 above are to be filed by the instructor with the dean of the school involved, with a recommendation concerning the amount of credit to be granted.

Students who in the judgment of one or more faculty members merit citation for special distinguished achievement shall have their names presented through the heads of instructional departments or directly to the Committee on Students of Superior Ability, together with such evidence of achievement as is available. The criteria for selecting students in this group are: (a) original thinking of consistently good quality; (b) achievement other than class work—publication of literary, artistic, or scientific work; (c) work which requires great ingenuity or industry, but which may not lead to definite publication; and (d) independent projects of reasonable magnitude carried out by the student on his own initiative.

Projects carried out by such students may receive special achievement credit. Students in this group are not eligible for the special privileges listed above for distinguished students.

ABBREVIATIONS

A&D—Art and Design	ED—Education	IT—Industrial Engineering Technology
AGR—Agriculture	EE—Electrical Engineering	MA—Mathematics
AGRY—Agronomy	ENGL—English	ME—Mechanical Engineering
BC—Architectural Engineering Technology	ENGR—Engineering	PEMN—Physical Education for Men
BIOL—Biological Sciences	ESC—Engineering Sciences	PEW—Physical Education for Women
CE—Civil Engineering	ET—Electrical Engineering Technology	PHAR—Pharmacy
CES—Civil Engineering Service Courses	FOR—Forestry and Conservation	PHCH—Pharmaceutical Chemistry
CHE—Chemical Engineering	FR—French	PHIL—Philosophy
CHM—Chemistry	GER—German	PHYS—Physics
CM—Chemical and Metallurgical Engineering Technology	GN—Personal Service Courses (General Studies)	PS—Physical Sciences
CS—Computer Science	GS—General Studies	PSY—Psychology
CT—Civil Engineering Technology	GVMT—Government	RUSS—Russian
DM—Mechanical Engineering Technology	HIST—History	SOC—Sociology
ECON—Economics	INDM—Industrial Management	SPAN—Spanish
		SPE—Speech
		STAT—Statistics

Schools of Engineering

Undergraduate instruction in aeronautical engineering, agricultural engineering, chemical engineering, civil engineering, electrical engineering, engineering sciences, industrial engineering, mechanical engineering, and metallurgical engineering leads to the degree of Bachelor of Science. In order to give the student sufficient time to adjust himself and to choose the branch of engineering for which he is best adapted, the following program of study during the freshman year is common for all engineering curricula. Only those students with adequate background training will be expected to accomplish this in two semesters. Students with inadequate preparation, particularly in mathematics and chemistry, may require an additional semester or summer session to attain sophomore standing. Sophomore plans of study available in some of the fields of engineering are indicated.

General Education Program

All engineering students are required to take a minimum of 24 credit hours of general education courses. These hours are distributed as indicated below.

1. Six credit hours in communications are required in the freshman engineering program. These are ENGL 101 or 103 and SPE 114.
2. The remaining 18 credit hours must be selected from two groups of course sequences, the first group being in the social sciences and the second group being in fine arts and humanities.
3. Each student must select one 12-hour sequence and one 6-hour sequence. No student may elect a 6-hour sequence from the same group from which he chose a 12-hour sequence.

GROUP I

12-hour sequences
 History and Political Science
 Sociology and Psychology
 General Studies
 (Social Sciences Survey)
 Economics

6-hour sequences
 History
 Political Science
 Sociology
 Psychology
 Economics
 Great Issues plus a variable
 credit reading course

GROUP II

12-hour sequences
Speech and Theatre
Language

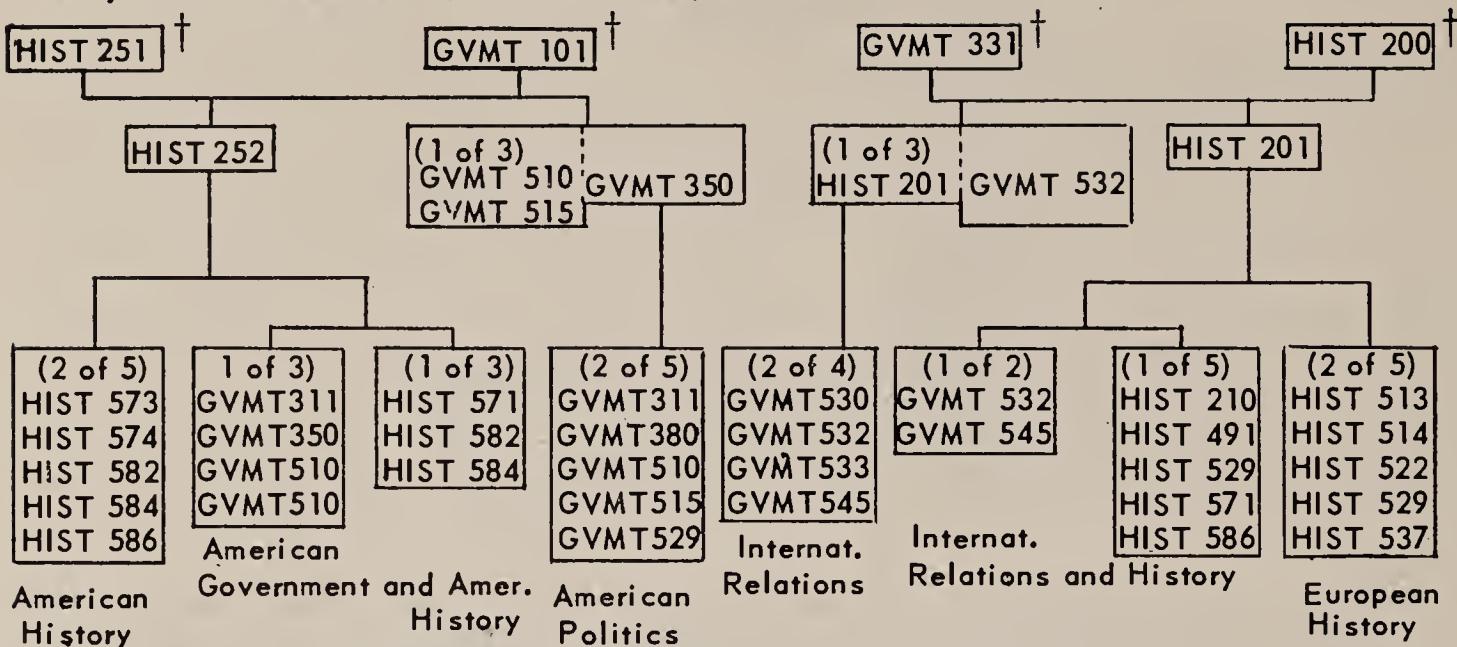
6-hour sequences
General Introduction to Literature
Speech
Theatre
Language
General Introduction to Philosophy
Creative Arts
Aesthetics and Appreciation

The above sequences are set up to give depth to the various programs in the social sciences, fine arts, and humanities. A pamphlet stating the objectives of the program in general education is available from academic counselors.

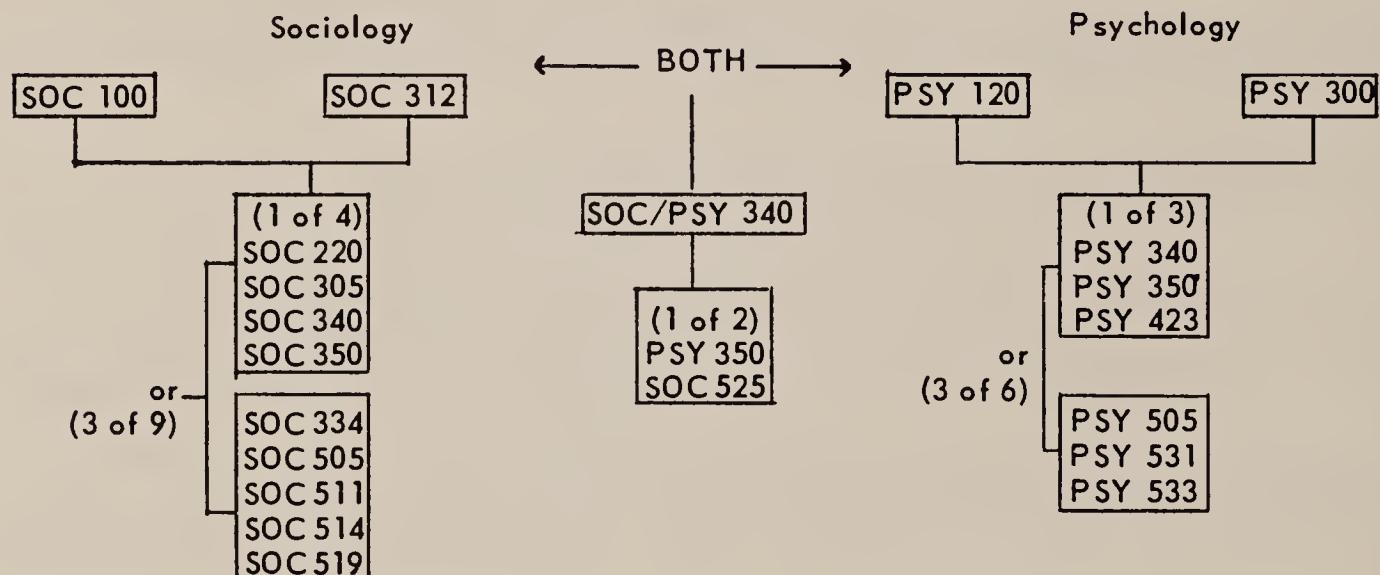
16 / PLANS OF STUDY

SOCIAL SCIENCES

History and/or Government (6 or 12 hour sequences)



Psychology and/or Sociology (6 or 12 hour sequences)



General Studies (6 hrs. only)

- (2 of 2)
 - GS 131
 - GS 132

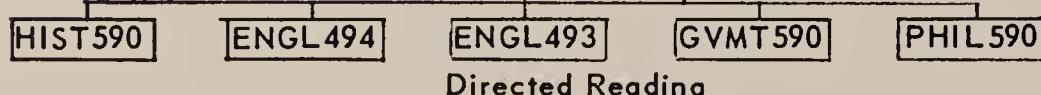
Great Issues (6 hrs. only)

- (2 of 2)
 - GS 435 - 2 cr.
 - GS 436 - 2 cr.

Economics (6 or 12 hrs)

- ECON 185
- ECON 213

- (2 of 7)
 - ECON 412
 - ECON 417
 - ECON 425
 - ECON 434
 - ECON 522
 - ECON 530
 - ECON 535



† The first six hours in the History and/or Government Sciences may be substituted by the six hours of the General Studies sequence.

HUMANITIES**Literature (6 or 12 hours)**

(2 of 2)
ENGL 230
ENGL 231

(2 of 4)
ENGL 235
ENGL 237
ENGL 238
ENGL 250

Speech and Theatre (6 or 12 hours)

(2 of 3)
SPE 318
SPE 517
SPE 518

(2 of 3)
SPE 353
SPE 356
SPE 554

Speech

Theatre

ENGL 442
(1 of 2)
ENGL 471
ENGL 570
English

ENGL 350
ENGL 351
(2 of 3)
ENGL 456
ENGL 472
ENGL 555

ENGL 460
ENGL 461
or
ENGL 462
ENGL 463
World

(2 of 5)
ENGL 442
ENGL 570
ENGL 573
ENGL 575
ENGL 576
Drama

(2 of 6)
ENGL 479
ENGL 575
ENGL 576
ENGL 577
ENGL 578
ENGL 579

(2 of 6)
ENGL 471
ENGL 472
ENGL 479
ENGL 574
ENGL 578
ENGL 579

Modern

Fiction

2 add'l of 6)
SPE 318
SPE 353
SPE 356
SPE 517
SPE 518
SPE 554

Foreign Language and Culture (6 or 12 hours)

FR 101
FR 102
FR 203
FR 204
and/or
FR 510
FR 515
FR 520
FR 525
FR 530
FR 550

GER 101
GER 102
GER 203
GER 204
and/or
GER 515
GER 516
GER 517
GER 518
GER 520
GER 530
GER 550

RUSS 101
RUSS 102
RUSS 203
RUSS 204
and/or
RUSS 305
RUSS 550

SPAN 101
SPAN 102
SPAN 203
SPAN 204
SPAN 264
.and/or
SPAN 305
SPAN 510
SPAN 520
SPAN 521
SPAN 527
SPAN 528
SPAN 530
SPAN 542

SPAN 550
SPAN 551

Philosophy (6 hours only)

PHIL 210 PHIL 211

(1 of 2)
PHIL 250
PHIL 306

Creative Arts

Writing
6 hrs. only

ENGL 405
(1 of 4)
ENGL 490
ENGL 507
ENGL 508
ENGL 509

Design
6 hrs. only

A&D 103
(2 of 3)
A&D 264
A&D 361
A&D 369

Representation
6 hrs. only

A&D 113

Aesthetics and
Appreciation

A&D 355
(1 of 4)
A&D 356
A&D 357
A&D 450
A&D 458

Art History
and Appre-
ciation

(1 or 2)
A & D 200
A & D 259
A & D 265
A & D 375

HIST course numbers as of September 1963 and (in parentheses) former numbers: 251 (204), 252 (205), 491 (530), 513 (410), 514 (415), 522 (451), 529 (535), 537 (555), 571 (545), 573 (507), 574 (510), 582 (500), 584 (505)..

FRESHMAN ENGINEERING*Program A:* Students fully qualified upon entrance.

First Semester		Second Semester	
Course Name	Credit Hrs.	Course Name	Credit Hrs.
CHM 115	4	CHM 116	4
MA 161	5	MA 162	5
SPE 114 or ENGL 101	3	ENGL 101 or SPE 114	3
ENGR 100	1	PHYS 152	4
Graphics, CE 118	3	General Elective	3
General Elective	3		
	19		19

Program B: Students with below average preparation in mathematics.

Course Name	Credit Hrs.	Course Name	Credit Hrs.
CHM 115	4	CHM 116	4
MA 151	5	MA 161	5
ENGL 101 or SPE 114	3	SPE 114 or ENGL 101	3
ENGR 100	1	General Elective	6
Graphics, CE 118	3		
	16		18

Program C: Students with below average preparation in chemistry.

Course Name	Credit Hrs.	Course Name	Credit Hrs.
CHM 100	3	CHM 115	4
MA 161	5	MA 162	5
SPE 114 or ENGL 101	3	ENGL 101 or SPE 114	3
ENGR 100	1	PHYS 152	4
Graphics, CE 118	3	General Elective	3
General Elective	3		
	18		19

Program D: Students with below average preparation in chemistry and mathematics.

Course Name	Credit Hrs.	Course Name	Credit Hrs.
CHM 100	3	CHM 115	4
MA 151	5	MA 161	5
ENGL 101 or SPE 114	3	SPE 114 or ENGL 101	3
ENGR 100	1	General Elective	6
Graphics, CE 118	3		
	15		18

Division of Applied Technology

Associate Degree Programs

The University has a number of two-year undergraduate programs leading to the Degree of Associate in Applied Science. The work offered in these programs is of University grade as are all undergraduate courses, but the offerings are much more applied in nature.

Curricula in this field are offered by a variety of institutions, and cover a considerable range as to duration and content of subject matter, but have in common the following purposes and characteristics:

- (1) The purpose is to prepare individuals for various technical positions or lines of activity encompassed within the field of engineering, but the scope of the programs is more limited than that required to prepare a person for a career as a professional engineer.
- (2) Programs of instruction are essentially technological in nature, based upon principles of science and include sufficient post-secondary school mathematics to provide the tools to accomplish the technical objectives of the curricula.
- (3) Emphasis is placed upon the use of rational processes in the principal fundamental portions of the curricula that fulfill the stated objectives and purposes.
- (4) Programs of instruction are briefer and usually more completely technical in content than professional curricula, though they are concerned with the same general fields of industry and engineering. They do not lead to the baccalaureate degree in engineering.
- (5) Training for artisanship is not included within the scope of education of technical institute type.

CURRICULUM IN ARCHITECTURAL ENGINEERING TECHNOLOGY

This curriculum is designed to prepare students for technological employment with contractors, building materials suppliers, architects, civil engineers, and related governmental agencies.

Emphasis is placed on construction materials and processes, specifications, regulations, estimating, surveying, frame and masonry construction, and architectural and structural drafting, as well as on related courses in mathematics and physical science.

Also included are courses dealing with some of the historical, economic, and human relations aspects related to the individual in our American industrial life.

Graduates are prepared to accept positions as estimators, expeditors, planning technicians, field inspectors, architectural detailers, architectural draftsmen, and sales representatives. With experience, after completing this program of study, graduates are now holding positions as field engineers, technical engineers, junior structural engineers, engineering assistants, shop superintendents, and real estate brokers. This field of specialization is well designed to help the student who is interested in going into the construction business for himself.

20 / PLANS OF STUDY

FRESHMAN YEAR*

	First Semester			Second Semester		
Course No.		Credit	Course No.		Credit	
BC 116	Architectural Drawing	2	BC 156	Frame Construction .	3	
ENGL 101	English Composition	3	BC 164	Building Materials .	3	
MA 111	Algebra	3	DM 212	Mechanics of Materials	4	
PS 136	Physics: Mechanics and Heat	4	CE 113	Slide Rules and Graphs	1	
PSY 120 or SOC 100	Psychology	3	MA 112	Trigonometry	3	
BC 172	Introductory Sociology	3	PS 176	Physics: Electricity, Sound, and Light..	4	
	Systems of Construction	2				
			—			
			17			

CURRICULUM IN INDUSTRIAL ENGINEERING TECHNOLOGY

This major field of specialization is designed to prepare students primarily for technological services in the industrial engineering areas of production planning and control, plant layout, quality control, job evaluation, and cost analysis. It also covers the essentials of management with which foremen, supervisors, and administrative personnel in general are concerned.

Typical jobs are time-study man, methods planner, production control clerk, stock supervisor, cost analyst, job analyst, and personnel interviewer.

Emphasis is placed upon courses in motion and time study, job evaluation, wage incentives, production and operation planning, plant layout, and industrial safety, and on courses in mathematics, physics, and chemistry.

Also included are courses dealing with some of the historical, economic and human relations aspects of our American industrial life, all related to the individual.

FRESHMAN YEAR

	First Semester			Second Semester		
Course No.		Credit	Course No.		Credit	
CES 110	Drafting Fundamentals	3	ENGL 101	English Composition	3	
IT 104	Industrial Organization and Management	4	IT 120	Systems and Procedures	3	
IT 110	Electronic Data Processing	3	IT 262	Motion Study and Work Methods	3	
MA 151	Elementary Mathematics for Engineering and the Physical Sciences	5	PSY 370	Psychology and Business and Industry..	3	
PS 136	Physics: Mechanics and Heat	4	CE 113	Slide Rules and Graphs	1	
			PS 176	Physics: Electricity, Sound, and Light..	4	
			—			
			19			

* Sophomore year available at the Calumet Campus.

SOPHOMORE YEAR

First Semester				Second Semester			
IT	200	Computer Programming Fundamentals .	3	IT	212	Industrial Safety . . .	2
ECON	210	Principles of Economics	3	IT	224	Production Planning and Control	4
IT	152	Human Relations in Industry	3	IT	250	Fundamentals of Production Cost Analysis	3
IT	204	Techniques of Maintaining Quality	3	GN	220	Technical Report Writing	3
IT	266	Work Measurement and Incentives	3	MA	224	Introductory Analysis II	3
MA	223	Introductory Analysis I or Elective (3)	3	SPE	114	Principles of Speech	3
							—
							18
			—				
			18				

ELECTIVES

GN	268	Elements of Law	3
ET	106	Introduction to Computer Fundamentals	3
IT	208	Integrated Systems Analysis	3
IT	268	Plant Layout	3
IT	272	Job Evaluation	2
IT	296	Industrial Engineering Case Problems	2
IT	312	Materials Handling	3
IT	368	Legislation Affecting Industrial Relations	4
PS	284	Instrumentation	3
STAT	351	Elementary Statistics I	3
STAT	352	Elementary Statistics II	3

CURRICULUM IN MECHANICAL ENGINEERING TECHNOLOGY

This program of study has been designed to prepare students to take employment in industries requiring services of drafting and design of a mechanical nature.

Emphasis is placed on product and tool design, mechanical maintenance, testing, inspection, and the selection of methods for efficient and economical production.

Also included are courses dealing with fundamentals of industrial management and with some of the historical, economic, and human relations aspects of our American industrial life, all related to the individual.

Graduates of this program accept jobs as laboratory technicians, engineering assistants, detailers, draftsmen, tool maintenance men, plant maintenance men, layout men, inspectors, and machine and tool salesmen. With additional experience students may aspire to positions as industrial supervisors, machine and tool designers, tool buyers, production expeditors, and cost estimators.

22 / PLANS OF STUDY

FRESHMAN YEAR*							
		First Semester	Credit	Course No.		Second Semester	Credit
Course No.							
CES 110		Drafting Fundamentals	3	DM 156		Graphical Computations	3
DM 180		Materials and Processes	3	DM 204		Production Drawing	3
ENGL 101		English Composition I	3	DM 212		Mechanics of Materials	4
MA 111		Algebra	3	MA 112		Trigonometry	3
PS 136		Physics: Mechanics and Heat	4	PS 176		Physics: Electricity, Heat, Sound	4
SOC 100		Introductory Sociology	3	CES 113		Slide Rules and Graphs	1
or							
PSY 120		Elementary Psychology	3				
			—	19			—
							18

CERTIFICATE PROGRAMS IN APPLIED TECHNOLOGY

The certificate programs are designed primarily for the more mature part-time student through consultation with leaders from business and industry. Each program is actively reviewed in the light of the latest trends in manufacturing and plant and business operations.

These are intensive and practical programs of less than 40 semester hours of credit. Advancement in each of these programs can be varied to suit the needs of the individual student who may take one, two, or three courses each semester. The average part-time student can complete any one of the programs within three years.

Enrollment is on the basis of a program carefully tailored to meet individual student needs and vocational objectives through consultation with an experienced counselor. Changes in the student's program arising out of new work assignments or changes in vocational objective may be worked out with his counselor.

In those engineering technology areas which have a counterpart in the two-year curricula, a student may work toward the certificate and then toward the associate degree, provided he has been admitted as a regular student.

ARCHITECTURAL DRAFTING CERTIFICATE PROGRAM

This is the counterpart of the Architectural Engineering Technology program. It is an intensive and practical program of 36 semester hours credit designed to prepare part-time students for technological employment with architects or to aid beginning employees in quickly developing greater competence in this field.

In the earlier courses, emphasis is placed on the fundamentals of architectural drafting as commonly utilized in architecture. After competence in the fundamental techniques is established, the emphasis shifts to fundamental knowledge of materials and practices in modern architecture and to general knowledge required of architects' assistants.

* Sophomore year available at the Calumet Campus.

APPLIED TECHNOLOGY / 23

Course No.	Credits
MA 111 Algebra	3
BC 116 Architectural Drawing	2
BC 164 Building Materials	3
MA 112 Trigonometry	3
PS 136 Physics: Mechanics and Heat	4
BC 156 Frame Construction	3
BC 276 Specifications and Contract Documents	2
BC 236 Architectural Projections	2
BC 220 Concrete and Masonry Construction	3
DM 212 Mechanics of Materials	4
BC 172 Systems of Construction	2
BC 256 Structural Drafting	3
BC 204 Building Regulations	2
	—
	36

MACHINE DESIGN CERTIFICATE PROGRAM

This is the counterpart of the Mechanical Engineering Technology program and is an intensive and practical program of 38 semester hours. It is designed to train part-time students in the fundamentals of industrial drafting and to work progressively into the principles of mechanical design.

It prepares and assists technical employees to work in drafting techniques associated with general product design or as mechanical engineering assistants.

Course No.	Credits
CES 110 Drafting Fundamentals	3
MA 111 Algebra	3
DM 156 Graphical Computation	3
MA 112 Trigonometry	3
DM 180 Materials and Processes	3
PS 136 Physics: Mechanics and Heat	4
DM 204 Production Drawing	3
DM 212 Mechanics of Materials	4
DM 228 Machine Design I	3
DM 264 Machine Design II	3
DM 216 Machine Elements	3
DM 232 Dynamics and Mechanisms	3
	—

38

INDUSTRIAL AND LABOR RELATIONS CERTIFICATE PROGRAM

Training in industrial and labor relations is essential for those engaged in the field of employment relationship. Sound employee-employer relations prevail only where representatives of both sides, labor and management, are adequately trained and experienced. The two-year day and evening course of study provides labor relations assistants and union officers with professional education needed to handle the basic problems that arise in industry and labor. The program consists of 29 credits.

24 / PLANS OF STUDY

Required Courses			Credits
GN	240	Labor Relations Problems	3
GN	268	Elements of Law	3
IT	104	Industrial Organization and Production	4
Recommended Courses			
ENGL	101	English Composition	3
PSY	120	Psychology	3
*GN	204	Fundamentals of Practical Speaking	2
GN	260	Economics of Industry	2
GN	264	Conference Speaking	2
IT	152	Human Relations in Industry	3
IT	368	Legislation Affecting Industrial Relations....	4
Optional Courses			
IT	260	Motion and Time Study	3
IT	272	Job Evaluation	2
IT	280	Wage Incentives	2

PROFESSIONAL FOREMANSHIP CERTIFICATE PROGRAM

The Professional Foremanship certificate program is an intensive and practical curriculum equivalent to 37 semester hours. It is intended to provide foremen with the professional education needed to handle the many supervisory and technical problems which they meet daily in technical, communications, and human relations fields.

The program has been set up by representatives of industry, professional foremen's organizations, and the University. It is designed to meet the needs of management, concerned with training foremen for positions of leadership.

The Professional Foremanship program is the certificate program counterpart of the Industrial Engineering Technology two-year curriculum. Enrollment is on the basis of a program worked out with the counselor assigned and carefully tailored to individual needs.

Students admitted in the temporary classification may qualify for the certificate in Professional Foremanship by taking approved undergraduate level, lower division technology courses for which their admission classification establishes eligibility and for which they have necessary prerequisites. Appropriate credits earned in this program while in the temporary student classification may be used for credit toward an associate degree under rules governing reclassification as a regular student.

Required Courses—11 semester hours minimum

Course No.		Credits	Credits
IT	104 Industrial Organization and Production...	4	4
PSY	120 Psychology OR	3	—
GN	120 Psychology	—	2
IT	152 Human Relations in Industry	3	3
SP	114 Principles of Speech OR	3	—
GN	204 Fundamentals of Practical Speaking	—	2
		—	—
		13	11

* Students may substitute: SP 114 Speech (3).

Optional Courses—14 semester hours maximum chosen from one or a combination of the following groups:

Group I—14 semester hours maximum

Communications—10 semester hours maximum
English and Report Writing—7 hours maximum
Advanced courses in Speech—3 hours maximum
Economics and Labor Relations—6 hours maximum
Physical Sciences—12 hours maximum

Group II—8 semester hours maximum

Courses specific to two-year diploma curricula—8 semester hours maximum
Courses from one or more technologies may be elected in this group provided that (1) they relate directly to the individual's duties, responsibilities, or line of promotability; and (2) prior approval of the counselor and the head of the Department of Engineering Technology is obtained.

MANAGEMENT EXPERIENCE—(Equivalent to 12 semester hours)

Before receiving the Professional Foremanship Certificate, the candidate must have had two years of successful experience in the management field. Satisfaction of this requirement is met by a confirming letter from the managerial employer under whom the candidate worked. Formal credit is not established for this work, but it is considered equivalent to 12 semester hours of credit in the Professional Foremanship program.

TOOL DESIGN CERTIFICATE PROGRAM

This is the counterpart of the Mechanical Engineering Technology program. It is an intensive and practical program of 35 semester hours designed to train part-time students in the fundamentals of industrial drafting and to advance them progressively into the principles of design as applied to industrial production tools and machines.

Course No.	Credits
CES 110 Drafting Fundamentals	3
MA 111 Algebra	3
DM 156 Graphical Computations	3
MA 112 Trigonometry	3
DM 204 Production Drawing	3
PS 136 Physics: Mechanics and Heat	4
DM 212 Mechanics of Materials	4
DM 236 Jig and Fixture Design	3
DM 288 Die Design	3
DM 216 Machine Elements	3
DM 232 Dynamics and Mechanisms	3

Department of Industrial Education

In addition to the Division of Applied Technology, the Department of Industrial Education is a part of the University Extension Administration. Four-year plans of study in this area lead to the degree of Bachelor of Science in Industrial Education. The department offers five options toward the bachelor's degree.

Following are the core requirements for all students in industrial education. Details of the programs offered and of courses required beyond the core subjects are found in the Division of Applied Technology catalog.

The core requirements are:

ED 260 or IED 260	3 hours
English Composition (ENGL 101, 102)	6 hours
Developmental Reading (ENGL 185)	1 hour
Grammar and Usage (ENGL 425)	3 hours
Speech (SPE 114)	3 hours
Psychology (PSY 120, ED 285)	6 hours
Philosophy (PHIL 210)	3 hours
Social Sciences (HIST 252, GVMT 101, ECON 210, SOC 100)	12 hours
Mathematics (A 111 and 112 or 123 and 124)	6 hours
Chemistry (CHM 113, 114)	6 hours
Physics (PHYS 220, 221)	8 hours
Technical and Applied Arts (TAA 115, 117, 215, 212)	8 hours
Drafting (CES 114, 115)	4 hours

School of Humanities Social Science, and Education

Three bachelor's degrees are offered in the School of Humanities, Social Science, and Education: Bachelor of Arts, Bachelor of Science, and Bachelor of Physical Education. All programs leading to these four degrees have certain requirements in common:

- A. Satisfaction of the general University requirements in military training and physical education;
- B. Satisfaction of the minimum scholastic index requirements as established by the faculty;
- C. The general University requirements for residence, payment of diploma fee, attendance at commencement exercises, etc. For further details about these requirements, see the *General Information Bulletin*.

Bachelor of Arts and Bachelor of Science

The program leading to the degree Bachelor of Science is followed by students majoring in audiology and speech sciences, or psychology. The program leading to the degree Bachelor of Arts is followed by students majoring in any of the fields of humanities or social sciences, in high school teaching in any of these fields, or by women students preparing to teach physical education.

In addition to the University-wide requirements for the bachelor's degree (military training, physical education, minimum scholastic index as established by the faculty, etc.), the requirements for the Bachelor of Arts and Bachelor of Science degrees are:

- A. Completion of the required courses listed under General Education Requirements which are designed to insure the broad liberal education of the student;
- B. Selection of an area of concentration, or of a major and a minor, and the completion of the requirements on file in the office of the dean;
- C. Completion of at least 126 semester hours of credit within ten years preceding the date of graduation.

General Education Requirements

About one half of the total program is devoted to the satisfaction of the "core requirements," which have been chosen with a view to broadening each student's background. These requirements for the B.A. and B.S. degrees are:

English Composition (ENGL 101, 202, or 103 or equivalent).....	6 hours
Speech (SPE 116)	3 hours
Foreign Language (Courses numbered 101, 102, 203, 204; or proficiency in 204 or higher in one modern foreign language).....	12 hours
Literature (Any six hours for which student is qualified in English or a foreign language)	6 hours
Mathematics (MA 123, 124, or 133, 134, or 153, 154)	6 hours
Natural or Physical Science (A six-hour laboratory sequence in physics, chemistry, or biology)	6 hours
Social and Behavioral Sciences.....	15 hours
6 hours history—(HIST 200, 201; or 251, 252; or GS 131, 132)	
3 hours sociology or psychology	
SOC 100; for second course, SOC 220 or 305	
for juniors and seniors—SOC 312; for second course, SOC 300 and above.	
3 hours government or economics	
GVMT 101; for second course GVMT 331 or 350	
ECON 185 (may be elected by those taking only 3 hours)	
ECON 210; for second course, ECON 212	
3 hours of sociology, psychology, government, or economics	
Philosophy (PHIL 210, 211, or 250).....	3 hours
Art, Music, Theatre (A&D 355, 356, 357; SPE 240, 250, 353, 356; GS 370, 371)	3 hours
General Studies (GS 435 or 436)	2 hours
	—
	62 hours

Areas of Concentration

Before the end of his third semester, each student will select (1) an area of concentration or (2) a major and a minor. The area, or the major and minor, provides the concentration necessary for admission to a graduate school, for a teaching certificate, or for a general and well-rounded education.

An area program will require from 33 to 40 semester hours beyond the general education requirements. A major will require about 24 semester hours

28 / PLANS OF STUDY

and a minor about 12. The requirements of the concentration area selected by the student become requirements for his graduation.

Each student must file his choice of area of concentration or major and minor at the office of the dean not later than the end of the third semester on forms available at that office. No student will be permitted to register as a junior unless his concentration choice has been filed. The choice of area of major and minor may be changed subsequently by the student, with permission of the dean. The following areas, majors and minors are available:

Areas

American Civilization	English Literature
American Government and Politics	French
American Literature	German
Art and Design	International Relations
Audiology and Speech Sciences	Physical Education for Men
Child Development and Family Life	Radio
Creative Writing	Recreation Leadership
Deliberative Speech	Russian
Dramatics	Spanish
English Honors	Speech

Teaching Majors

Arts and Crafts	Health and Safety
Audiology and Speech Sciences	Physical Education (Women)
Elementary Education	Recreation
English	Social Studies
Foreign Languages	Speech

Majors

American Government and Politics	Literature (American)
Commercial Art	Literature (English)
Creative Writing	Philosophy
Family and Community Living	Physical Education (Women)
French	Psychology
German	Recreation
History (American)	Russian
History (European)	Sociology
Interior Design	Spanish
International Relations	Speech

Minors

Commercial Art	Philosophy
Economics	Psychology
French	Recreation
German	Russian
Health and Safety	Sociology
History	Spanish
Interior Design	Speech
Literature	

Plans of Study

Each student's program for the four years will be based on one of several plans of study, appropriately modified to fit his concentration requirements and his exemptions, i.e., proficiency in modern language, ENGL 103, etc.

Students who plan to teach in high school will use the plan of study for the major subject-matter field, or comprehensive areas, of the teaching certificate for which they expect to qualify.

BACHELOR OF ARTS—GENERAL PROGRAM

FRESHMAN YEAR

First Semester	Second Semester
(4) BIO 108 (Introduction to Botany)	(4) BIO 109 (Introduction to Zoology)
(3) ENGL 101 (English Composition I)	(3) SPE 114 (Principles of Speech)
(3) MA 123 (Foundations of Mathematics I)	(3) MA 124 (Foundations of Mathematics II)
(3) Modern Language	(3) Modern Language
(3) Social Science	(3) Social Science
(2-3) Elective or Physical Education	(1) ENGL 185 (Developmental Reading)
<hr style="border-top: 1px solid black;"/>	(1-3) Elective or Physical Education
(18-19)	<hr style="border-top: 1px solid black;"/> (18-20)

SOPHOMORE YEAR

First Semester	Second Semester
(3) ENGL 230 (Introduction to Literature)	(3) ENGL 231 (Introduction to Literature)
(3) Social Science	(3) Social Science
(3) Modern Language	(3) Modern Language
(3) Physical Science	(3) Physical Science
(3) PSY 120 (Elementary Psychology)	(3) ENGL 202 (English Composition II)
(1) Physical Education	(1) Physical Education
<hr style="border-top: 1px solid black;"/>	<hr style="border-top: 1px solid black;"/>
(16)	(16)

ELEMENTARY EDUCATION

Preparation in elementary education is offered to a limited number of students chosen on the basis of above-average scholarship, leadership qualities, good mental and physical health, and positive attitudes toward children and teaching as a profession. In addition to the core program of all students and the professional program in elementary education the student will have 24 semester hours for a major in the field of his choice.

30 / PLANS OF STUDY

FRESHMAN YEAR

First Semester	Second Semester
(3) ENGL 101 or 103 (English Composition)	(3) GVMT 102 (Introduction to Government)
(3) GVMT 101 (Introduction to Government) or HIST 251 (American History to 1865)	or HIST 252 (The U.S. and Its Place in World Affairs)
(4) MA 133 (Math for Elem. Teachers I).	(4) MA 134 (Math for Elem. Teachers II)
(3) Modern Language	(3) Modern Language
(1) PEW 100 (Physical Education)	(1) ENGL 185 (Developmental Reading)
(1) PEW 103 (Personal Hygiene)	(1) PEW 100 (Physical Education)
(3) SPE 114 (Principles of Speech)	(3) PSY 120 (Elementary Psychology)
—	—
(18)	(18)

SOPHOMORE YEAR

First Semester	Second Semester
(3) BIOL 205 (Biology for Elementary Teachers)	(3) BIOL 206 (Biology for Elementary Teachers)
(3) ENGL 230 (Introduction to Literature)	(3) Aesthetics
(3) SOC 100 (Introductory Sociology)	(3) SOC 220 (Social Problems)
(3) CHM 113 (Introductory Chemistry)	(3) CHM 114 (Introductory Chemistry)
(3) Modern Language	(3) Modern Language
(1) PEW 100 (Physical Education)	(1) PEW 100 (Physical Education)
—	—
(16)	(19)

PHYSICAL EDUCATION (WOMEN)

FRESHMAN YEAR

First Semester	Second Semester
(3) ENGL 101 or 103 (English Composition)	(3) ENGL 230 or 231 (Introduction to Literature)
(3) SPE 114 (Principles of Speech)	(3) PSY 120 (Elementary Psychology)
(3) MA 123 (Elementary Concepts of Mathematics I)	(3) MA 124 (Elementary Concepts of Mathematics II)
(3) Modern Language	(3) Modern Language
(3) Social Science	(3) Social Science
(2-3) Physical Education or Elective	(1-3) Physical Education or Elective
—	—

PSYCHOLOGY OR AUDIOLOGY AND SPEECH SCIENCES

FRESHMAN YEAR

First Semester	Second Semester
(3) ENGL 101 or 103 (English Composition)	(3) ENGL 202 (English Composition II)
(3) SPE 114 (Principles of Speech)	(1) ENGL 185 (Developmental Reading)
(3) BIOL 109 (Introduction to Zoology)	(3) BIOL 108 (Introduction to Botany)
(3) MA 123 (Elementary Concepts of Mathematics I)	(3) MA 124 (Elementary Concepts of Mathematics II)
(3) Social Science	(3) PSY 120 (Elementary Psychology)
(2-3) Physical Education or Elective	(3) Social Science
—	(1-3) Physical Education or Elective
(17-18)	—
	(17-19)

BACHELOR OF PHYSICAL EDUCATION

FRESHMAN YEAR

First Semester	Second Semester
(4) BIOL 109 (Introduction to Zoology)	(4) BIOL 108 (Introduction to Botany)
(3) ENGL 101 (English Composition I)	(3) ENGL 202 (English Composition II)
(3) SOC 100 (Introductory Sociology)	(3) SPE 114 (Principles of Speech)
(3) PSY 120 (Elementary Psychology)	(3) SOC 220 (Social Problems)
(3) ENGL 230 (Introduction to Literature)	(3) Social Science
—	(1) ENGL 185 (Developmental Reading)
(16)	—
	(17)

School of Science

The School of Science consists of the Department of Biological Sciences, the Department of Chemistry, the Department of Physics, and the Division of Mathematical Sciences.

Curricula leading to two degrees, Bachelor of Science and Bachelor of Science in Chemistry, are offered by the School of Science. Specific details of these curricula and the requirements for the degrees are listed in the School of Science catalog.

The School of Science offers training to selected students who wish to prepare themselves to teach in the fields of biology, chemistry, mathematics, physics, or in certain combinations of these fields.

BACHELOR OF SCIENCE DEGREE

General Education Requirements

The following general requirements for the B.S. degree in the School of Science are supplemented by requirements of the department of the student's

32 / PLANS OF STUDY

major. Particular attention is drawn to modifications allowed in the curricula for prospective high school teachers (as indicated below).

1. A total of 124 semester hours, plus physical education or military science as specified by the University.

2. English composition: ENGL 101 and 202, or ENGL 103 entered by achievement examination and completed with a grade of C or better.

3. Modern foreign language: Pass a fourth-semester college-level course in a modern foreign language, or pass an equivalent proficiency examination. In high school teacher curricula, the student must pass a second-semester college-level course in a modern foreign language or pass a proficiency examination.

4. Humanities, Social Science, and Behavioral Sciences: The minimum requirement is 18 hours, but it is strongly recommended that the student take more than a minimal program. Six hours must be chosen from each of two of the following areas:

- a. literature, philosophy
- b. history, government
- c. economics, sociology, psychology

In addition, a satisfactory two-course sequence must be chosen from one of the above areas.

5. Mathematics: At least 11 hours, except for certain curricula in the biological sciences.

6. Science: Each student must take at least four courses in laboratory science (biology, chemistry, geology, physics) *outside his major area*. It is preferable that he take two-course sequences in each of two sciences; in no case shall he satisfy this requirement by courses drawn from more than two sciences.

BIOLOGICAL SCIENCES, PREMEDICINE, PREDENTISTRY, AND MEDICAL TECHNOLOGY

FRESHMAN YEAR

First Semester	Second Semester
(3) BIOL 109 (Introduction to Zoology)	(3) BIOL 108 (Introduction to Botany)
(4) CHM 115 (General Chemistry)	(4) CHM 116 (General Chemistry)
(3) ENGL 101 (English Composition I)	(3) SPE 114 (Principles of Speech)
(3) MA 153 (Algebra and Trigonometry I)	(3) MA 154 (Algebra and Trigonometry II)
(3) Modern Language*	(3) Modern Language
(3) Elective	(3) Elective
—	—
19	19

* German or Russian is recommended.

CHEMISTRY**FRESHMAN YEAR**

First Semester	Second Semester
(4) CHM 115 (General Chemistry)	(4) CHM 116 (General Chemistry)
(3) ENGL 101 (English Composition)	(3) SPE 114 (Principles of Speech)
(3) GER 101 (First Course in German)	(3) GER 102 (Second Course in German)
(5) MA 161 (Mathematics for Engineering and the Physical Sciences I)	(5) MA 162 (Mathematics for Engineering and the Physical Sciences II)
(1-4) Elective or Physical Education	(4) PHYS 152 (Mechanics and Sound)
—	—
16-19	19

MATHEMATICS**FRESHMAN YEAR**

First Semester	Second Semester
(5) MA 161 (Mathematics for Engineering and the Physical Sciences I)	(5) MA 162 (Mathematics for Engineering and the Physical Sciences II)
(3) ENGL 101 (English Composition I)	(3) SPE 114 (Principles of Speech)
(3) Modern Language	(3) Modern Language
(4) Science Elective	(4) Science Elective
(1) Physical Education	(1) Physical Education
—	—
16	16

PHYSICS**FRESHMAN YEAR**

First Semester	Second Semester
(3) ENGL 101 (English Composition I)	(4) CHM 116 (General Chemistry)
(4) CHM 115 (General Chemistry)	(1) Physical Education
(1) Physical Education	(5) MA 162 (Mathematics for Engineering and the Physical Sciences II)
(5) MA 161 (Mathematics for Engineering and the Physical Sciences I)	(4) PHYS 152 (Mechanics and Sound)
(1) ENGL 185 (Developmental Reading)	(3) Modern Language
(3) Modern Language	—
—	(17)
(17)	

PREPHARMACY

The Purdue School of Pharmacy and Pharmacal Sciences does not admit students directly from high school. Students wishing to prepare for the profession of pharmacy register in the School of Science for the prepharmacy program and apply for transfer to the School of Pharmacy and Pharmacal Sciences at the end of the freshman year. Application for the transfer should be filed with the dean of the Pharmacy School or with the pharmacy adviser before April 1. Students who, for any reason, do not transfer to the School of Pharmacy and Pharmacal Sciences may apply for transfer to any other school of the University or may remain in the School of Science, with a change of educational objective.

34 / PLANS OF STUDY

FIRST YEAR

First Semester		Second Semester	
(3)	MA 153 (Algebra and Trigonometry I)	(3)	MA 154 (Algebra and Trigonometry II)
(4)	CHM 109 (General Chemistry)	(4)	CHM 110 (General Chemistry)
(3)	ENGL 101 (English Composition)	(3)	SPE 114 (Principles of Speech)
(3)	SOC 100 (Introductory Sociology)	(3)	PSY 120 (Elementary Psychology)
(3)	Elective	(1)	ENGL 185 (Developmental Reading)
<hr/>		<hr/>	
16		(3)	Elective
		<hr/>	
		17	

BACHELOR OF SCIENCE IN CHEMISTRY DEGREE

This sample program for the freshman year presupposes placement in CHM 117. For details of general education and chemistry course requirements for this degree, see the catalog of the School of Science.

FRESHMAN YEAR

First Semester		Second Semester	
(5)	CHM 117	(5)	CHM 126
(5)	MA 161	(5)	MA 162
(3)	ENGL 101	(3)	ENGL 102
(3)	GER 101	(3)	GER 102
(2)	MILT 110	(2)	MILT 120
<hr/>		<hr/>	
(18)		(18)	

School of Industrial Management

FRESHMAN YEAR

First Semester		Second Semester	
(4)	CHM 115 (General Chemistry)	(4)	CHM 116 (General Chemistry)
(5)	MA 151* (Elementary Mathematics I)	(5)	MA 152* (Elementary Mathematics II)
(3)	ENGL 101 (English Composition I)	(3)	SPE 114 (Principles of Speech)
(3)	GVMT 101 (Introduction to Government)	(3)	HIST 252 (The United States and Its Place in World Affairs)
(1)	ENGL 185 (Developmental Reading)	(2-3)	Physical Education or Elective
(2-3)	Physical Education or Elective	<hr/>	(17-18)
<hr/>			
(18-19)			

School of Agriculture

Plans for study in the School of Agriculture include options in agricultural economics, agricultural business management, agricultural education, agronomy, soil and crop science, animal sciences, dairy manufacturing, entomology, food technology, structural pest control, general agriculture, and horticultural science. Study leads to one of three bachelor's degrees in agriculture, agricultural economics, or forestry.

* Qualified students should take MA 161 and MA 162 in place of MA 151 and 152.

GENERAL AGRICULTURE

FRESHMAN YEAR

	First Semester	Second Semester
(4)	BIOL 109 (Introduction to Zoology)	(4) BIOL 108 (Introduction to Botany)
(3)	CHM 111 (General Chemistry)	(3) CHM 112 (General Chemistry)
(3)	ENGL 101 (English Composition I)	(3) SPE 114 (Principles of Speech)
(3)	Elective	(3) MA 154 (Algebra and Trigonometry II)
(3)	Elective*	(6) Electives
(3)	MA 153 (Algebra and Trigonometry I)	—
		19

—
19

AGRICULTURAL ENGINEERING

See Freshmen Engineering Programs on page 18.

AGRICULTURAL SCIENCE

FRESHMAN YEAR

	First Semester	Second Semester
(4)	CHM 115 (General Chemistry)	(4) CHM 116 (General Chemistry)
(4)	BIOL 109 (Introduction to Zoology)	(4) BIOL 108 (Introduction to Botany)
(3)	ENGL 101 (English Composition I)	(3) SPE 114 (Principles of Speech)
(3)	MA 153 (Algebra and Trigonometry I)	(3) MA 154 (Algebra and Trigonometry II)
(3)	ECON 210 (Principles of Economics)	(3) ENGL 202 (English Composition II)
		—
		17

—
17

BIOCHEMISTRY

FRESHMAN YEAR

	First Semester	Second Semester
(4)	BIOL 109 (Introduction to Zoology)	(4) BIOL 108 (Introduction to Botany)
(4)	CHM 115 (General Chemistry)	(4) CHM 116 (General Chemistry)
(3)	MA 153 (Algebra and Trigonometry I)	(3) MA 154 (Algebra and Trigonometry II)
(3)	ENGL 101 (English Composition I)	(3) Modern Language
(1)	ENGL 185 (Developmental Reading)	(3) SPE 114 (Principles of Speech)
(3)	Elective	—
		17

—
18

*Dairy manufacturing freshmen may use PSY 120 or SOC 100 as a freshman elective in the first semester and GVMT 101 or SOC 100 in the second semester.

Freshmen specializing in horticulture may use PSY 120 as a freshman elective in the first semester and GVMT 101 in the second semester. Freshman in the agricultural economics and the agricultural administration options should elect AGEC 100.

FOOD TECHNOLOGY**FRESHMAN YEAR**

First Semester	Second Semester
(3) CHM 111 (General Chemistry)	(3) CHM 112 (General Chemistry)
(4) BIOL 109 (Introduction to Zoology)	(4) BIOL 108 (Introduction to Botany)
(3) ENGL 101 (English Composition I)	(3) SPE 114 (Principles of Speech)
(3) MA 153	(3) MA 154
(3) Elective	(3) Elective
<hr/> 16	<hr/> 16

FORESTRY AND CONSERVATION**FRESHMAN YEAR**

Common to all Forestry curricula

First Semester	Second Semester
(4) BIOL 108 (Introduction to Botany)	(4) BIOL 109 (Introduction to Zoology)
(3) CHM 111 (General Chemistry)	(3) CHM 112 (General Chemistry)
(3) ENGL 101 (English Composition I)	(3) ENGL 202 (English Composition II)
(3) MA 153	(3) MA 154
(3) ECON 210 (Principles of Economics)	(3) SPE 114 (Principles of Speech)
<hr/> (16)	<hr/> (16)

PREVETERINARY CURRICULUM

An organized four-semester preveterinary curriculum meeting requirements for admission to the School of Veterinary Science and Medicine is available in the School of Agriculture.

This curriculum also provides a strong program in the biological and physical sciences which may be used as a basis for continued training in the School of Agriculture should the degree Bachelor of Science in Agriculture be desired.

There is opportunity to obtain the degrees of Bachelor of Science in Agriculture and Doctor of Veterinary Medicine within a seven-year program. The Bachelor of Science in Agriculture in the general agriculture option is awarded following successful completion of three years in the School of Agriculture and the first two years in the School of Veterinary Science and Medicine; subsequent successful completion of the second two years in the School of Veterinary Science and Medicine will enable the student to receive the degree of Doctor of Veterinary Medicine. In this program the first two years are the preveterinary curriculum; the third year is in the general agriculture option following which the student must apply to and be admitted to the School of Veterinary Science and Medicine for the remaining four years.

FRESHMAN YEAR

First Semester	Second Semester
(3) ENGL 101 (English Composition I)	(3) ENGL 202 (English Composition II)
(4) CHM 111 (General Chemistry)	(4) CHM 112 (General Chemistry with Qualitative Analysis)
(3) MA 153	(4) BIOL 108 (Introduction to Botany)
(3) Elective	(3) SPE 114
(4) BIOL 109 (Introduction to Zoology)	(3) MA 154
—	—
(17)	(17)

School of Home Economics

The plan of study in home economics is designed to prepare young men and women for professional work in the various areas of the field and at the same time to provide a broad general education which prepares the student to meet the needs for home and community living.

Areas of concentration include art and design, child development (nursery-kindergarten), clothing and textiles, foods and nutrition, food management, foods in business, food research, home economics extension, housing, and vocational home economics teaching.

Students interested in preparation for work in the fields mentioned above should enroll in the curriculum listed below.

FRESHMAN YEAR

First Semester	Second Semester
(3) ENGL 101 or 103 (English Composition)	(3) ENGL 202 (English Composition II)
(3) CHM 111 (General Chemistry)	(3) CHM 112 (General Chemistry)
(3) Mathematics	(3) ENGL 230 (Introduction to Literature)
(3) SOC 100 (Introductory Sociology)	(3) PSY 120 (Elementary Psychology)
(3) SPE 114 (Principles of Speech)	(3) ECON 210 (Principles of Economics)
(1) PEW 100 (Physical Education)	(1) PEW 100 (Physical Education)
(1) PEW 103 (Hygiene)	(1) ENGL 185 (Developmental Reading)
—	—
(17)	(17)

Description of Courses

Courses numbered 1 to 499 are primarily for undergraduate students. Courses numbered 500 to 599 are for undergraduates (usually juniors and seniors) and graduate students. Courses numbered 600 and above are for graduate students.

For each course the first part of the description should be interpreted as follows: first, the official number of the course; second, its special title; and third, the number of class, laboratory, and credit hours.

BC—ARCHITECTURAL ENGINEERING TECHNOLOGY

116. ARCHITECTURAL DRAWING. Lab. 6, cr. 2.

Introduction to architectural drawing, including use of instruments, lettering, orthographic projection, isometric views, and simple working drawings.

156. FRAME CONSTRUCTION. Class 1, Lab. 6, cr. 3. Must be preceded by BC 116.

Problems of wood frame structure, such as houses, details, and elementary design.

164. BUILDING MATERIALS. Class 3, cr. 3. Properties and use of materials as found in building construction.

172. SYSTEMS OF CONSTRUCTION. Class 2, cr. 2.

Survey of different types of construction, including wood, steel, and reinforced concrete and curtain walls, considering the characteristics, advantages, and limitations.

BIOL—BIOLOGICAL SCIENCES

108 INTRODUCTION TO BOTANY. Sem. 1 and 2. Class 3, Lab. 3, cr. 4. (1 A, 3 P, el. S).

Introduction to the growth, functioning, structures, heredity, diversity of plants, and their interactions with the environment.

109. INTRODUCTION TO ZOOLOGY. Sem. 1 and 2. Class 2, Lab. 4, cr. 4. (1 A, 3 P, el. S).

Introduction to the structure, functioning, heredity, development, classification, and evolution of animals, and their interactions with the environment.

205. BIOLOGY FOR ELEMENTARY SCHOOL TEACHERS. Sem. 1. Class 2, Lab. 2, cr. 3.

Introduction to biology applicable to teaching in the elementary schools, including aspects of conservation, safety, nutrition, personal and public health.

206. BIOLOGY FOR ELEMENTARY SCHOOL TEACHERS. Sem. 2. Class 2, Lab. 2, cr. 3.

Continuation of BIOL 205.

EG—ENGINEERING GRAPHICS

110. DRAFTING FUNDAMENTALS. Sem. 1. Class 1, Lab. 6, cr. 3. (1 IED, el.).

Designed for teachers of drawing. A basic course in drawing; orthographic projection, pictorial sketching, print reading, and reproduction of drawings. Problems designed to require practical reasoning and develop good techniques.

111. ADVANCED DRAFTING. Sem. 1 and 2. Class 1, Lab. 6, cr. 3. (2 IED, el.). Must be preceded by CES 110.

Preparation of assembly and detail drawings, including fasteners, limit dimensioning, and shop notes. Intersections and developments with sheet metal applications. Symbols and construction details used in architectural drafting.

MECHANICAL ENGINEERING TECHNOLOGY / 39

113. SLIDE RULES AND GRAPHS. Lab. 2, cr. 1. Must be preceded or accompanied by MA 112 or 151.

Principles and use of the slide rule for division, multiplication, trigonometry, powers, and roots. Properties and types of coordinate graphs for scientific and engineering purposes; calculation and plotting graphs: uniform, log, semilog, and others.

118. ENGINEERING GRAPHICS. Class 1, Lab. 6, cr. 3. Must be preceded or accompanied by MA 151 or 161.

Graphical methods used in engineering design, layout, and calculation. Multiview and pictorial drawing and sketching of technical objects; basic dimensioning practice; conventional representation.

100. ELEMENTARY CHEMISTRY. Sem. 1. Class 3, cr. 3.

Does not carry credit toward graduation in the schools of Engineering and Science, Education, and Humanities. Does not serve as a prerequisite to CHM 108, 110, 112, or 114.

An introductory chemistry course.

109. GENERAL CHEMISTRY. Sem. 1. Class 3, Lab. 3, cr. 4. (op. 1 S).

Required for all freshmen in the pre-pharmacy option of the School of Humanities, Social Science, and Education.

110. GENERAL CHEMISTRY WITH QUANTITATIVE ANALYSIS. Sem. 2. Class 2, Lab. 6, cr. 4. (op. 2 S).

Continuation of CHM 109 with laboratory work in qualitative analysis.

111. GENERAL CHEMISTRY. Sem. 1 and 2. Class 2, Lab. 3, cr. 3. (1 A, 5 IED, el. H, op. 1 S).

Required for all freshmen registered in the School of Agriculture or in biology options of the School of Humanities, Social Science, and Education who are not in CHM 115 or 117.

112. GENERAL CHEMISTRY. Sem. 1 and 2. SS. Class 2, Lab. 3, cr. 3. (2 A, 6 IED, el. H, op. 2 S).

Continuation of CHM III.

113. INTRODUCTORY CHEMISTRY. Sem. 1. Class 2, Lab. 3, cr. 3. (3 HU).

Designed as a terminal course to create a background for those who do not expect to take further work in chemistry. With CHM 114, it satisfies the physical science requirement in the School of Humanities, Social Science, and Education.

114. INTRODUCTORY CHEMISTRY. Sem. 2. Class 2, Lab. 3, cr. 3. (4 HU). Must be preceded by CHM 113 or equivalent.

Continuation of CHM 113.

115. GENERAL CHEMISTRY. Sem. 1 and 2. SS. Class 3, Lab. 3, cr. 4. (1 ENGR, IED, op. 1 A, S).

Required of students majoring in chemistry, physics, and engineering who do not take CHM 117-126.

Laws and principles of chemistry, with special emphasis on topics of importance in engineering. Numerical problems and relationships are introduced whenever quantitative treatment is possible.

116. GENERAL CHEMISTRY. Sem. 1 and 2. SS. Class 3, Lab. 3, cr. 4. (2 ENGR, IED, op. 2 A, S).

A continuation of CHM 115.

DM—MECHANICAL ENGINEERING TECHNOLOGY

DM 156. GRAPHICAL COMPUTATIONS.

Class 1, Lab. 6, cr. 3. Must be preceded by CES 110 and preceded or accompanied by MA 112.

Descriptive and analytic geometry principles applied to the solution of engineering problems; intersections and development of planes and solids; layout of objects in space; and determination of clearances between objects in space.

DM 180. MATERIALS AND PROCESSES.

Class 3, cr. 3.

Application and characteristics, both physical and chemical, of the materials most commonly used in industry; the mechanical processes by which materials may be shaped or formed.

40 / DESCRIPTION OF COURSES

DM 204. PRODUCTION DRAWING. Class 1, Lab. 6, cr. 3. Must be preceded by CES 110 and preceded or accompanied by DM 180.

Preparation of working drawings from layouts, drafting simplification, functional dimensioning, assembly drawings, detailing of machine elements, working with manufacturers' catalogs, applying fits, limits and tolerances to dimensions for interchangeable manufacture; information as to material, physical treatment, and manufacturing processes. The student works from layouts with a minimum of

information so that self reliance in detailing may be developed.

DM 212. MECHANICS OF MATERIALS. Class 4, cr. 4. Must be preceded by PS 136 and preceded or accompanied by MA 112.

Forces acting on rigid bodies at rest and in motion-embracing vectors, force and moment laws of equilibrium for various force systems, centroids, center of gravity and moments of inertia, stress and strain, riveted and welded joints, torsion, shear, bending and deflection of beams, combined stresses and columns.

ECON—ECONOMICS

210. PRINCIPLES OF ECONOMICS. Sem. 1 and 2. SS. Class 3, cr. 3. (S, A, el. ENGR, P). Credit will be given for only one of ECON 210, 213, 215.

Study of the basic economic institutions, such as business, labor organizations, banks, and government. Analysis of the effects of competition, monopoly, and government on allocation of resources in pro-

duction and consumption; factors affecting size and growth of national income.

212. PRINCIPLES OF ECONOMICS II. Sem. 1 and 2. SS. Class 3, cr. 3 (el. 4, 5, 6, 7, 8). Must be preceded by ECON 210.

Continuation of ECON 210. Emphasis on more thorough understanding of basic principles and their application to solving economic problems.

ED—EDUCATION

285. EDUCATIONAL PSYCHOLOGY. Sem. 1 and 2. SS. Class 3, cr. 3. (4 H, IED, PEM, op. 4 S, 6 A). Must be preceded by PSY 120.

An introduction to the application of psychology to education, with particular emphasis on human development and learning.

The development of vocational and educational guidance in the home, school, industry, and service organizations; consideration of the principles and present practices in such guidance.

500. AUDIO-VISUAL AIDS FOR TEACHERS. Sem. 1 and 2. SS. cr. 2 or 3. Must be preceded by 12 hours of education and psychology.

Sources, selection, and effective use of audio-visual aids and preparation of audio-visual materials.

518. EDUCATIONAL PROBLEMS OF TEACHERS. SS. cr. 1 to 4.

Primarily for experienced teachers desiring credit from special workshops or individual study. Topics of individual study will deal with problems which arise from the professional work of classroom teachers.

504. INTRODUCTION TO MEASUREMENT AND EVALUATION. Sem. 1 and 2. SS. Class 2, Lab. 2, cr. 3.

An introduction to the basic concepts and principles of management and evaluation with special emphasis on descriptive statistics, and on teacher-made and standardized tests.

530. ADVANCED EDUCATIONAL PSYCHOLOGY. Sem. 1. SS. Class 3, cr. 3 (el.). Must be preceded by PSY 120 and ED 285.

Principles of learning evaluated in relation to current methods of instruction and to the result from research in education and psychology.

510. PRINCIPLES AND PROBLEMS OF VOCATIONAL AND EDUCATIONAL GUIDANCE. Sem. 1 and 2. SS. Class 3, cr. 3. Must be preceded by 12 hours of psychology and education or equivalent professional training.

580. LIBRARY MATERIALS FOR CHILDREN. Sem. 2. SS. Class 3, cr. 3. Must be preceded by five hours of education and psychology.

The selection and use of library materials for children.

600. HISTORY AND PHILOSOPHY OF EDUCATION. SS. Sem. 1 and 2. Class 3, cr. 3. Must be preceded by 12 hours in education.

Consideration of the major ideas, trends, and movements in the development of American education.

620. SECONDARY SCHOOL CURRICULUM. SS. Sem. 1. cr. 2 or 3.

Objectives, organization, and administration of the secondary school curriculum.

626. ELEMENTARY SCHOOL CURRICULUM.

SS. Sem. 2. Class 3, cr. 3. Must be preceded by 12 hours in education and psychology.

Needs of children and society; modern programs; procedures for developing a curriculum, including ways to improve the present offerings of a school.

627. REVIEW OF RESEARCH IN ELEMENTARY EDUCATION. SS. cr. 3. Must be preceded by ED 430 or equivalent.

A study of research important generally to elementary education. Critical analysis of research in one area of special interest.

632. PUBLIC SCHOOL ADMINISTRATION.

SS. Sem. 2. Class 3, cr. 3. Must be preceded by ED 285, 304, and 502.

Public school organization and administration, including school records and statistics.

ENGL—ENGLISH

101. ENGLISH COMPOSITION I. Class 3, cr. 3. Prerequisite to all courses in English except ENGL 2, 3, 103, and 185.

Purpose: to develop competence in written expression through directed practice in writing. Emphasis on problems of mechanics and organization.

102. ENGLISH COMPOSITION II. Class 3, cr. 3. The second half of the basic composition course. Emphasis on problems of diction and logical analysis.

A student who has received a grade of A in ENGL 101 may, with the approval of the head of his school, substitute for ENGL 202 an elective course in English.

103. ENGLISH COMPOSITION. Sem. 1 and 2. SS. Class 3, cr. 3. (Freshmen).

A composition course for freshmen provisionally excused from ENGL 101 on the basis of orientation tests. The course attempts to develop writing on a high critical level, improve reading tastes, and arouse an interest in the humanities and conflicting intellectual attitudes. Credit in the course may not be established by examination.

185. DEVELOPMENTAL READING. Lab. 2, cr. 1.

Purpose: to increase reading efficiency by improving comprehension and by developing the motor skills involved in reading speed. Motivates reading interest through use of films and pacers.

230. INTRODUCTION TO LITERATURE. Class 3, cr. 3. Not open to students with credit for ENGL 238.

Reading and discussion of major works in English, American, and continental literature to develop an understanding of style, form, and ideas characteristic of great works. Emphasis on types of narrative literature.

With ENGL 231 it satisfies literature requirement of School of Humanities, Social Science, and Education.

231. INTRODUCTION TO LITERATURE. Class 3, cr. 3.

Reading and discussion of major works in English, American, and continental literature to develop an understanding of style, form, and ideas characteristic of great works. Emphasis on various types of literature.

238. INTRODUCTION TO FICTION. Class 3, cr. 3. Not open to students with credit for ENGL 230.

Reading and discussion of selected short stories and seven novels, to promote awareness, understanding, and appreciation of the range, values, techniques, and meanings of reputable modern fiction.

250. GREAT AMERICAN BOOKS. Class 3, cr. 3.

Seven books, such as *The Scarlet Letter*, *Moby Dick*, and *Walden*, read and discussed as to their literary qualities and their cultural significance.

42 / DESCRIPTION OF COURSES

285. **CRITICAL READING.** Sem. 1 and 2. Class 2, cr. 2. Prerequisite: ENGL 185 or consent of instructor.

Close reading of selected current magazines and newspapers, emphasizing efficient techniques for finding general meaning. Includes the application of elementary logical and semantic analysis.

286. **VOCABULARY BUILDING.** Sem. 1 and 2. Lab. 2, cr. 1.

Development of vocabulary through study of the characteristics of the language, usage, and word formation; exercises and dictionary practice; selected readings.

ENGR—ENGINEERING

100. **FRESHMAN ENGINEERING LECTURES.** Class 1, cr. 1.

An introduction to the engineering profession.

FR—FRENCH

101. **FIRST COURSE IN FRENCH.** Class 3, Lab. 1, cr. 3. For beginners only.

Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for FR 101 without satisfactorily completing a more advanced course in French.

102. **SECOND COURSE IN FRENCH.** Class 3, Lab. 1, cr. 3. Must be preceded by FR 101 or equivalent.

Continuation of FR 101.

203. **THIRD COURSE IN FRENCH.** Class 3, cr. 3 (op. or el.). Must be preceded by FR 102 or equivalent.

Readings from works of modern and contemporary French writers; practice in speaking and writing French.

204. **FOURTH COURSE IN FRENCH.** Class 3, cr. 3 (op. or el.). Must be preceded by FR 203 or equivalent.

Continuation of FR 203.

GER—GERMAN

101. **FIRST COURSE IN GERMAN.** Class 3, Lab. 1, cr. 3. For beginners only.

Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for GER 101 without satisfactorily completing a more advanced course in German.

102. **SECOND COURSE IN GERMAN.** Class 3, Lab. 1, cr. 3. Must be preceded by GER 101 or equivalent.

Continuation of GER 101.

203. **THIRD COURSE IN GERMAN.** Class 3, cr. 3 (op. or el.). Must be preceded by GER 102 or equivalent.

Readings from the works of nineteenth century and contemporary German writers; practice in speaking and writing German.

204. **FOURTH COURSE IN GERMAN.** Class 3, cr. 3 (op. or el.). Must be preceded by GER 203 or equivalent.

GN—GENERAL STUDIES

GN 100. **TECHNICAL INSTITUTE ORIENTATION LECTURES.** Class 1, cr. 1.

Required of all full-time students and must be taken in first semester of enrollment.

The organization and services of the university related to the student. The relationships of the engineers, technicians, and tradesmen to one another and to industry. The development and function of the technical institutes and of the separate technologies. Guidance in adapting to the university and preparation for industrial jobs.

GN 204. **FUNDAMENTALS OF PRACTICAL SPEAKING.** Class 2, cr. 2.

Organization and presentation of material, voice and physical delivery, audience reaction.

GN 220. **TECHNICAL REPORT WRITING.** Class 3, cr. 3.

Extensive application of the principles of good writing in industrial reporting, with emphasis on the techniques of presenting information graphically as well as in a clear, concise written form.

GN 232. DEMOCRATIC GOVERNMENT.
Class 2, cr. 2.

A study of the development of democratic government in the U.S. and other democratic areas of the world.

GN 240. LABOR RELATIONS PROBLEMS.
Class 3, cr. 3.

Problems of workers with possible solutions as suggested by organized labor and management. Regulations concerning management, labor, the collective bargaining agreement, grievance and arbitration procedures.

GN 260. ECONOMICS OF INDUSTRY. Class 2, cr. 2.

Fundamental economics principles which

affect everyone, with particular emphasis upon their application to industry.

GN 264. CONFERENCE SPEAKING. Class 2, cr. 2. Must be preceded by GN 204.

Training and practice in conducting and participating in small group conferences, shop committees, instructional groups, problem-solving groups.

GN 268. ELEMENTS OF LAW. Class 3, cr. 3.

An introductory law course, with a brief comparison of the American federal system and the parliamentary system of government; and covering law, with emphasis on judicial review, court jurisdiction, and procedure generally and basic law in particular.

GVMT—GOVERNMENT

101. INTRODUCTION TO GOVERNMENT.
Class 3, cr. 3.

The problems of government as illustrated by American national government. Attention to political theory as well as to the organization and problems of government.

102. INTRODUCTION TO GOVERNMENT.
Sem. 1 and 2. Class 3, cr. 3. (el. 2, 3, 4). Must be preceded by GVMT 101.

State and local government: powers, relationships, and problems of administration, with emphasis on the Middle Western States.

331. INTERNATIONAL RELATIONS. Sem. 1 and 2. SS. Class 3, cr. 3. (el.).

Introductory survey of the underlying forces in international relations, the foreign policies of the great powers, and agencies of control and cooperation.

HIST—HISTORY

200. EARLY CIVILIZATION. Sem. 1 and 2. SS. Class 3, cr. 3. (el.).

A survey of European development from earliest times through the sixteenth century, this course is designed to meet the needs of the beginning student in European and world history.

201. DEVELOPMENT OF MODERN CIVILIZATION. Class 3, cr. 3.

A continuation of HIST 200, this course traces the expansion of Europe into the Americas, Africa, and Asia. The French Revolution, nationalism, and the development of Western European states from the sixteenth century to the present are studied.

251. AMERICAN HISTORY TO 1865. Class 3, cr. 3.

A study of the development of American political, economic, and social institutions from the early explorations and colonial settlements to the conclusion of the Civil War.

252. THE UNITED STATES AND ITS PLACE IN WORLD AFFAIRS. Class 3, cr. 3.

A study of the growth of the United States from the period of the Reconstruction to the present. The new industrialism, agrarian problems, territorial expansion, the two world wars, depression, the New Deal, and similar topics are analyzed.

INDM—INDUSTRIAL MANAGEMENT

200. INTRODUCTORY ACCOUNTING. Sem. 1 and 2. SS. Class 3, cr. 3. (Required of undergraduate students in pre-industrial management and industrial economics.)

Introduction to the fundamentals of accounting.

201. COST ACCOUNTING. Sem. 1, 2 and SS. Class 3, cr. 3. Must be preceded by INDM 200 or equivalent.

Nature of cost accounting; job orders, process, and standard cost methods. Preparation and uses of various types of cost reports.

IT—INDUSTRIAL ENGINEERING TECHNOLOGY

IT 104. INDUSTRIAL ORGANIZATION AND PRODUCTION. Class 4, cr. 4.

A detailed survey of organizational structures; operational, financial, marketing, and accounting activities; duties of management, planning, control, personnel, safety, wages, policy, and human factors necessary for effective management.

IT 105. INDUSTRIAL ORGANIZATION AND PRODUCTION I. Class 2, cr. 2.

Survey of organizational structures; operational, financial, marketing, and accounting activities; and human factors necessary for effective management of a small business. (First half of IT 104.)

IT 110. ELECTRONIC DATA PROCESSING. Class 3, cr. 3.

An introduction to data processing through the use of punched card and high-speed computer equipment. Surveys computers, techniques of problem solving and programming, typical computer applications and devaluation of proposed systems.

IT 120. SYSTEMS AND PROCEDURES. Class 3, cr. 3.

IT 152. HUMAN RELATIONS IN INDUSTRY. Class 3, cr. 3.

Study of the bases of human relations and the organization of individual and group behavior. Special emphasis on typical industrial and business relationships in everyday situations. Examines fundamental relationships between behavior and personal and group forces.

IT 200. COMPUTER PROGRAMMING FUNDAMENTALS. Class 3, cr. 3.

The descriptive presentation of the basic elements of programming digital computers. There is a treatment of absolute and symbolic coding or instruction; addressing; editing; printing control; magnetic tape functions; random access and sequential processing; and mathematical and universal programming concepts.

IT 204. TECHNIQUES OF MAINTAINING QUALITY. Class 2, Lab. 3, cr. 3. Must be preceded by IT 104 and preceded or accompanied by MA 112.

An analysis of the basic principles of inspection and the study of the various techniques and types of equipment connected with inspection processes. Includes methods of using mechanical, electronic, air and light devices for checking and measuring and other related techniques to determine quality levels of acceptance.

IT 208. INTEGRATED SYSTEMS ANALYSIS. Class 3, cr. 3.

Presents the concept of the management operating system; the organization as a system's model; operation research; systems administration; information and automatic production; selection, training, and organization of personnel; and project teams within the formal structure.

IT 212. INDUSTRIAL SAFETY. Class 2, cr. 2. Must be preceded by IT 104.

Safety fundamentals as related to the economics of accident prevention, analysis of accident causes, mechanical safeguards, fire prevention, plant housekeeping, occupational diseases, first aid, safety organization, protective equipment, and the promotion of safe practices.

IT 224. PRODUCTION PLANNING AND CONTROL. Class 3, Lab. 3, cr. 4. Must be preceded by DM 180 and IT 152.

Preproduction planning of the most economical methods, machines, operations, and materials for the manufacture of a product. The planning, scheduling, routing, and detailed procedure of production control.

IT 227. PRODUCTION PLANNING AND CONTROL. Class 3, cr. 3. Must be preceded by DM 180 and IT 152.

Preproduction planning of the most economical methods, machines, operations, and materials for the manufacture of a product. The planning, scheduling, rout-

ing, and detailed procedure of production control. (Same as IT 224 without laboratory.)

IT 244. FUNDAMENTALS OF PRODUCTION COST. Class 1, Lab. 3, cr. 2. Must be preceded by IT 104.

Fundamental mechanics (rules for debit and credit) of accounting, principles of account classification, business forms and procedures, financial and operating statements, and elements of cost accounting—all from the viewpoint of industrial organization.

IT 248. PRODUCTION COST ANALYSIS. Class 1, Lab. 3, cr. 2. Must be preceded by IT 244.

Specific applications of production cost theories to principles developed through study of selected case problems.

IT 250. FUNDAMENTALS OF PRODUCTION COST ANALYSIS. Class 2, Lab. 3, cr. 3. Must be preceded or accompanied by IT 104 except by approval of the technology chairman.

Surveys of fundamental mechanics of accounting principles of account classification, financial and operating statements, and the generation of cost data according to cost accounting principles. Surveys the generation of cost data according to the principles of engineering economy. Examines applications of cost accounting data and engineering economy cost data to specific management decision areas through selected case problems.

IT 260. MOTION AND TIME STUDY. Class 2, Lab. 3, cr. 3. Must be preceded by IT 152, DM 180, and MA 112.

Techniques of motion and time study, process charts, operation charts, multiple activity charts, micromotion study, therbligs, and stop-watch time study.

IT 262. MOTION STUDY AND WORK METHODS. Class 2, Lab. 3, cr. 3. Must be preceded by IT 152 and preceded or accompanied by MA 112 or equivalent.

The study of the various techniques of motion study including process charts, operation charts, multiple activity charts, micro and memo motion study, therbligs,

the movie camera, along with actual practice in their use. Includes study and application of the basic principles used to develop better methods of performing work.

IT 266. WORK MEASUREMENT AND INCENTIVES. Class 2, Lab. 3, cr. 3. Must be preceded by IT 262.

A study of the fundamentals of time study and work measurement with actual practice in their use. Includes stop watch time study, measuring work with movie camera, the establishment of allowances by both stop watch and work sampling studies, the establishment and use of predetermined time values, and the construction and use of work measurement formulae.

IT 268. PLANT LAYOUT. Class 2, Lab. 3, cr. 3. Must be preceded by CES 110, IT 224 and 260.

Arrangement of stock, machines, layout of aisles, and use of space, and material handling for the highest efficiency of production.

IT 272. JOB EVALUATION. Class 2, cr. 2. Must be preceded by IT 152 and MA 112.

A survey of the basic principles and significance of job evaluation. An analysis of current practices and techniques used in job analysis, job descriptions, and job evaluation.

IT 280. WAGE INCENTIVES. Class 2, cr. 2. Must be preceded by IT 260 and 272.

An analysis and study of various types of wage incentive plans, their significance, adaptability, effectiveness, and equitability. A systematic appraisal of the basic objectives and currently used techniques in the administration of wage incentive programs.

IT 296. INDUSTRIAL TECHNOLOGY CASE PROBLEMS. Class 2, cr. 2.

Application of theories developed in the several industrial technology courses to selected general case problems—to provide practice in the integration of principles.

MA—MATHEMATICS

1. **HIGH SCHOOL ALGEBRA.** Sem. 1. Class 1-5, cr. 0. Credit: one unit for admission.

2. **PLANE GEOMETRY.** Sem. 1 and 2. Class 5, cr. 0. Credit: one unit for admission.

4. **ADVANCED HIGH SCHOOL ALGEBRA.** Sem. 1 and 2. Class 2, cr. 0. Credit: one-half unit for admission. (Offered at Extension Centers only.)

For engineering students with an entrance deficiency in this subject.

46 / DESCRIPTION OF COURSES

111. **ALGEBRA.** Sem. 1 and 2. Class 3, cr. 3. (On Lafayette Campus, given only for Applied Technology Curricula. Not transferable from Regional Centers and Campuses except in Applied Technology Curricula).

112. **TRIGONOMETRY.** Sem. 1 and 2. Class 3, cr. 3. Not open to students with credit in MA 151 or MA 153.

For freshmen and others with two units of high school algebra.

115. **ALGEBRA.** Class 4, cr. 4. (Offered at Extension Centers only.)

116. **ANALYTIC GEOMETRY.** Class 4, cr. 4. (Offered at Extension Centers only.)

123. **ELEMENTARY CONCEPTS OF MATHEMATICS I.** Sem. 1 and 2. SS. Class 3, cr. 3. Not open to students with credit in MA 133.

Numeration system; natural numbers; mathematical systems; mathematical reasoning; elementary set theory; elementary logic; mathematical proof; the number system of arithmetic; arithmetic algorithms.

124. **ELEMENTARY CONCEPTS OF MATHEMATICS II.** Sem. 1 and 2. SS. Class 3, cr. 3. Must be preceded by MA 123. Not open to students with credit in MA 133.

The system of integers; rational numbers; polynomials; the real and complex number systems; elements of plane geometry; relations, functions, and graphs; elements of analytic geometry.

133. **MATHEMATICS FOR ELEMENTARY TEACHERS I.** Sem. 1 and 2. SS. Class 4, cr. 4. Not open to students with credit in MA 123.

Numeration systems; finite mathematical systems; abstract mathematical systems, groups, fields; natural numbers through rationals, a structural approach, properties, algorithms; mathematical reasoning and proof.

The sequence MA 133-134 fulfills the mathematics requirements for elementary education majors. MA 123-124 may be substituted for MA 133 in meeting this requirement.

134. **MATHEMATICS FOR ELEMENTARY TEACHERS II.** Sem. 1 and 2. SS. Class 4, cr. 4. Must be preceded by MA 133 or MA 124.

Informal study of metric and non-metric properties of geometric figures (primarily in a plane), measurement; introduction to foundations of Euclidean geometry.

The sequence MA 133-134 fulfills the mathematics requirements for elementary education majors. MA 123-124 may be substituted for MA 133 in meeting this requirement.

151. **ELEMENTARY MATHEMATICS FOR ENGINEERING AND THE PHYSICAL SCIENCES.** Sem. 1 and 2. SS. Class 5, cr. 5. Not open to students with credit in MA 153 or MA 154.

College algebra and trigonometry for students with inadequate preparation for MA 161. Does not carry credit toward graduation in the Schools of Engineering or the Division of Mathematical Sciences.

153. **ALGEBRA AND TRIGONOMETRY I.** Sem. 1 and 2. SS. Class 3, cr. 3. MA 153-154 is a two-semester version of MA 151.

Not open to students with credit in MA 151. Does not carry credit toward graduation in the Schools of Engineering and the Division of Mathematical Sciences.

154. **ALGEBRA AND TRIGONOMETRY II.** Sem. 1 and 2. SS. Class 3, cr. 3. Continuation of MA 153.

Not open to students with credit in MA 151. Does not carry credit toward graduation in the Schools of Engineering and the Division of Mathematical Sciences.

161. **MATHEMATICS FOR ENGINEERING AND THE PHYSICAL SCIENCES I.** Sem. 1 and 2. SS. Class 5, cr. 5. Analytic geometry and calculus; derivatives of algebraic functions.

Required of all students majoring in mathematics, physics, chemistry and engineering. Students with inadequate preparation will be required to take MA 151.

162. **MATHEMATICS FOR ENGINEERING AND THE PHYSICAL SCIENCES II.** Sem. 1 and 2. SS. Class 5, cr. 5. Must be preceded by MA 161.

Calculus: Integrals, applications of derivatives and integrals. Formal integration.

223. **INTRODUCTORY ANALYSIS I.** Sem. 1 and 2. SS. Class 3, cr. 3. Must be preceded by MA 151 or equivalent. Should be preceded by MA 214.

Elementary properties of algebraic systems; the real number system; analytic geometry, differential and integral calculus of one variable. Applications to problems in the biological and social sciences.

224. INTRODUCTORY ANALYSIS II. Sem. 1 and 2. SS. Class 3, cr. 3. Must be preceded by MA 223.

Partial derivatives; calculus of finite

differences; differentials; multiple integrals; introduction to difference and differential equations. Applications to problems in the biological and social sciences.

PEW—PHYSICAL EDUCATION FOR WOMEN

100. PHYSICAL EDUCATION. Sem. 1 and 2. Lab. 3, cr. 1. (Freshmen, Sophomores.)

A wide range of activities at varying levels of ability designed to develop recreational skills and interests and to contribute to the maintenance of physical well-being. Required of freshman and sophomore women for four semesters.

103. PERSONAL HYGIENE.* Sem. 1 and 2. Class 1, cr. 1. (Freshmen.)

Required for one semester of all freshman women and entering sophomores (sophomore 3) who do not have credit for an equivalent course. Orientation to health problems in college.

210. INTRODUCTION TO PHILOSOPHY. Sem. 1 and 2. Class 3, cr. 3.

The basic problems and types of philosophy, with special emphasis upon the problem of knowledge and nature of reality.

May be applied toward meeting the philosophy requirement of the School of Humanities, Social Science, and Education. Staff.

211. ETHICS. Sem. 1 and 2. Class 3, cr. 3.

An examination of the nature of moral

PHIL—PHILOSOPHY

values and a brief consideration of the basic problems involved in the philosophy of art. May be applied toward meeting the philosophy requirement of the School of Humanities, Social Science, and Education.

250. PRINCIPLES OF LOGIC. Class 3, cr. 3.

The theory and practice of deductive reasoning; immediate inference, the syllogism, hypothetical and disjunctive inference. Particular attention to semantic fallacies as embodied in current literature.

PHYS—PHYSICS

152. MECHANICS AND SOUND. Class 3, Lect.-Dem. 1, Lab. 2, cr. 4. Must be preceded or accompanied by MA 162.

Statics; uniform and accelerated motion; Newton's laws; circular motion; energy,

momentum, and conservation principles; dynamics of rotation; gravitation and planetary motion; elasticity; simple harmonic and wave motion; hydrostatics; hydrodynamics; intermolecular forces.

PS—PHYSICAL SCIENCES

PS 120. INTRODUCTION TO CHEMISTRY. Class 2, Lab. 3, cr. 3. Must be preceded or accompanied by MA 111.

The general basic principles of chemistry, including a study of important elements and their simpler compounds. Special emphasis is placed on industrial applications.

PS 136. PHYSICS: MECHANICS AND HEAT.

Lect. 2, Rec. 2, Lab. 2, cr. 4. Must be preceded or accompanied by MA 111.

Work, energy, power, efficiency of simple machines; equilibrium conditions for soilds, liquids, and gases; straight line and rotational motion—uniform and accelerated motion. Elementary principles of heat and their technical applications.

PS 176. PHYSICS: ELECTRICITY, SOUND, AND LIGHT. Lect. 2, Rec. 2, Lab. 2, cr. 4. Must be preceded by PS 136, except ET students.

Fundamental principles of electricity, wave emotion, sound, and light.

48 / DESCRIPTION OF COURSES

PS 204. FUNDAMENTALS OF QUALITY CONTROL. Class 2, cr. 2. Must be preceded by MA 111 and 112.

Frequency distributions, normal curve, average standard deviation, standard error

of the mean, x and R charts, "u" chart, rational sub-group, statistical aspects of tolerances, and the basic concepts of probability.

PSY—PSYCHOLOGY

120. ELEMENTARY PSYCHOLOGY. Class 3, cr. 3.

Introduction to the fundamental principles of psychology, covering particularly the topics of personality, intelligence, emotion, attention, perception, learning, memory, and thinking.

235. CHILD PSYCHOLOGY. Sem. 1 and 2.

Class 3, cr. 3. (3, 4, 5, 6 H, el.). Must be preceded by PSY 120 or its equivalent.

Age-level characteristics and needs of children from birth to the teens in motor control, language, learning, play, etc.; interpersonal relations and other factors affecting children.

340. GENERAL SOCIAL PSYCHOLOGY. Class 3, cr. 3. Must be preceded by six hours of psychology or three hours of psychology and three hours of sociology. GS 234 may be included as three hours of sociology. (Same as SOC 340.)

Conditions and consequences of human behavior in social situations, with emphasis upon the mechanism and the process on the bases of which socialization takes place.

350. ABNORMAL PSYCHOLOGY. Sem. 1 and 2. SS. Class 3, cr. 3. (el.). Must be preceded by three hours of psychology.

Various forms of mental disorder from the standpoint of their origin, treatment, prevention, social significance, and relation to problems of normal human adjustment.

370. PSYCHOLOGY IN BUSINESS AND INDUSTRY. Sem. 1 and 2. Class 3, cr. 3. (5, 6, 7, 8 IE, el.).

Applications of principles of behavior to human problems in business and industry, with emphasis upon leadership, employee motivation, communications, selection and training, and job environment.

500. STATISTICAL METHODS APPLIED TO PSYCHOLOGY, EDUCATION, AND SOCIOLOGY. Sem. 1 and 2. SS. Class 2, Lab. 2, cr. 3.

532. PSYCHOLOGY OF THE EXCEPTIONAL CHILD. Sem. 2. SS. Class 3, cr. 3. Must be preceded by six semester hours of psychology.

Principles of diagnostic testing, adaptive teaching, and guidance applied to the improvement of teaching and to the correction of learning difficulties of exceptional children.

534. PSYCHOLOGY OF ADOLESCENCE. Sem. 2. Class 3, cr. 3. (el.). Must be preceded by six semester hours of psychology.

Development during the teens, with special reference to general life problems facing youth of these ages, and an investigation into ways and means of helping youth to meet its problems constructively.

537. MENTAL HYGIENE IN EDUCATION. Sem. 1 and 2. SS. Class 3, cr. 3. (el.). Must be preceded by PSY 120 and ED 285.

550. INTRODUCTION TO CLINICAL PSYCHOLOGY. Sem. 1 and 2. SS. Class 3, cr. 3. (el.). Must be preceded by 12 hours of psychology.

SOC—SOCIOLOGY

100. INTRODUCTORY SOCIOLOGY. Sem. 1 and 2. SS. Class 3, cr. 3. (el.). May not be taken for credit by students of junior or senior standing.

A survey course designed to introduce the student to the science of human so-

cietry. Fundamental concepts, description, and analysis of society, culture, the socialization process, social institutions, and social change. A first course for sociology majors and a possible terminal course for nonmajors.

220. **SOCIAL PROBLEMS.** Sem. 1 and 2. SS. Class 3, cr. 3. (el.). Must be preceded by SOC 100 or GS 234 or equivalent.

Analysis of problem conditions in modern society—family disorganization, racial conflicts, class struggle, mental illness, narcotic addiction, gambling, alcoholism, and others. Social factors involved in the development, continued existence, and amelioration of these conditions.

340. **GENERAL SOCIAL PSYCHOLOGY.** Sem. 1 and 2. SS. Clas 3, cr. 3. (el.). Must be preceded by three hours of psychology and/or sociology or equivalent. (Same as PSY 340.)

Conditions and consequences of human behavior in social situations, emphasis upon the mechanism and the processes on the basis of which socialization takes place.

SPAN—SPANISH

101. **FIRST COURSE IN SPANISH.** Class 3, Lab. 1, cr. 3. (op. or el.).

For students who have had no previous work in Spanish.

102. **SECOND COURSE IN SPANISH.** Class 3, Lab. 1, cr. 3. (op. or el.). Must be preceded by SPAN 101 or equivalent.

203. **THIRD COURSE IN SPANISH.** Class 3, cr. 3. (op. or el.). Must be preceded by SPAN 102 or equivalent.

Readings from the works of nineteenth century and contemporary Spanish writers; practice in speaking and writing Spanish.

204. **FOURTH COURSE IN SPANISH (READING).** Sem. 1 and 2. Class 3, cr. 3. (op. or el.). Must be preceded by SPAN 203 or equivalent.

Primary emphasis on reading, but some practice in speaking.

SPE—SPEECH

114. **PRINCIPLES OF SPEECH.** Sem. 1 and 2. SS. Class 3, cr. 3. (1 or 2 A, PEM 1, 2, 3, 4, 5, 6 ENGR, IED, el.).

314. **ADVANCED PUBLIC SPEAKING.** Sem. 1 and 2. SS. Class 3, cr. 3. (el. 4, 5, 6, 7, 8). Must be preceded by SPE 114 or 116.

Development of a marked degree of skill in the composition and delivery of various types of speeches; special empha-

sis on speeches related to the student's major vocational area.

320. **GROUP DISCUSSION.** Sem. 1 and 2. SS. Class 3, cr. 3. (el.). Must be preceded by SPE 114 or 116.

A study of group thinking and problem-solving methods; participation in and evaluation of committee and informal discussion groups.

ADMINISTRATIVE AND INSTRUCTIONAL STAFF

GEORGE R. AVERITT (1961).....Lecturer in Economics
A.B., Indiana, 1953.

ROBERT E. BARTLEY (1963).....Lecturer in Accounting
B.A., Michigan State, 1958.

RAYMOND M. BOBILLO (1962).....Lecturer in Industrial Engineering Technology
B.S., Ball State, 1950.

ANITA O. BOWSER (1956).....Instructor in History and Government
A.B., Kent State, 1945; LL.B., William McKinley School of Law, 1949.

JOHN G. CHILLSON (1962).....Lecturer in English
B.S., Northern State, 1953; M.S., Indiana State, 1959.

ALLAN A. GDALMAN (1963)....Lecturer in Civil Engineering Technology
B.S., Purdue, 1960.

WILLIAM GILLICK (1961).....Lecturer in Industrial Engineering Technology
A.B., Indiana, 1940.

RONALD D. GOODFELLOW (1962)....Lecturer in Architectural Engineering Technology
B.Arch., Michigan, 1953.

FRANCES M. GOURLEY (1948).....Lecturer in Zoology
B.S., Illinois, 1935; M.S., 1940.

HUSSEN HAKIM (1963).....Lecturer in Modern Languages
B.A., Indiana, 1958; M.A., Ball State, 1960.

MARCELLA M. HARTMAN (1962)...Lecturer in Modern Languages
B.A., Indiana, 1921; M.A., Northwestern, 1951.

ELLIOTT C. HUTTON (1961).....Lecturer in Mechanical Engineering Technology
B.S., Iowa State Teachers, 1936; M.S., Oregon State, 1939.

ROBERT E. JOHNSON (1960).....Lecturer in Architectural Engineering Technology
B.Arch., Michigan, 1951.

FREDERICK R. LISARELLI (1946)...Assistant Professor of Drafting and Mechanical Engineering Technology
B.S., Alabama, 1938; M.A., Columbia, 1946.

C. DeLOS LONZO (1955).....Lecturer in History and Government
A.B., Franklin, 1947; M.A., Indiana, 1952.

HARRY M. LYKENS (1963).....Lecturer in Mathematics
B.S., Ball State, 1958; M.A., 1961.

GEORGE MC INTIRE (1953).....Lecturer in Education
A.B., Oakland City, 1926; A.M., Indiana, 1931.

JOHN A. MOHAMED (1962).....Lecturer in Education
B.S., Indiana, 1950; M.A., Northwestern, 1956.

HOWARD D. MURDOCK (1946)....Assistant Professor of Chemistry and Biology
B.S., Notre Dame, 1937; M.A., 1940.

ARNOLD O. MYHRE (1961).....Lecturer in Psychology
B.A., Washington, 1936; M.A., Columbia, 1943; Ed.D., Colorado State, 1953.

THOMAS R. NUNN (1946).....Associate Professor of English
A.B., Central Mich College of Education, 1935; A.M., Michigan, 1940.

ROBERT F. SCHWARZ (1952)....Director of the Purdue-Barker Memorial Center, with the rank of Associate Professor; Manager of the North Central Region
A.B., Indiana, 1950; M.S., 1952.

EILEEN M. SINCLAIR (1963)....Lecturer in Psychology
B.A., Manitoba, 1936; M.A., Michigan, 1942; Ph.D., Northwestern, 1947.

ROBERTA J. H. SWANSON (1962)...Lecturer in Psychology
B.S., Alabama Polytechnic, 1955; M.S., Purdue, 1957.

LAWRENCE T. TANBER (1952)....Lecturer in Mechanical Engineering Technology
A.T.A., Purdue, 1951.

THOMAS G. WALENGA (1963).....Lecturer in Physical Education
B.S., Ball State, 1961.

RICHARD E. WILSON (1963)....Assistant Director of the Purdue-Barker Memorial Center, With the Rank of Assistant Professor
B.S., Southern Illinois, 1957; M.S., 1958; Ed.D., Michigan State, 1963.

MARGARET A. WRIGHT (1963)....Lecturer in Psychology
B.S., Indiana, 1958; M.S., 1961.

MELVIN YODER (1956).....Lecturer in Industrial Technology
A.B., Bluffton, 1941.

INDEX

Abbreviations	13
Administrative officers	4
Admission	5
Agriculture, School of	34
Applied technology	19
Architectural drafting certificate program	22
Architectural engineering technology	19, 38
Associate degree	19
B.A. general program	29
B.S. general program	31
B.S. in Chemistry	34
Bachelor of Physical Education	31
Biological sciences	32, 38
Calendar	IFC
Certificate programs	22
Chemistry	33, 34, 39
Degrees with distinction	12
Description of courses	
engineering	42
architectural engineering technology	38
economics	40
engineering graphics	38
French	42
German	42
history	43
industrial engineering technology	44
philosophy	47
physical sciences	47
Spanish	49
mathematics	45
mechanical engineering technology	39
industrial management	44
biological sciences	38
chemistry	39
education	40
English	41
general studies	42
government	43
physical education for women	47
physics	47
psychology	48
sociology	48
speech	49
Distinguished students	11
Drop index	11
Dropping and adding courses	7
Dropping of students	11
Economics	40
Education	40
Elementary education	29
Engineering, Schools of	14
Engineering graphics	38
Engineering technology	42
English	19
Fees	41
French	7
Freshman engineering	42
General information	18
General studies	5
German	42
Good standing	42
Government	9
Grades	43
Graduation index	8
requirement	10
History	43
Home Economics, School of	37
Humanities, Social Science, and Education, School of	26
Industrial and labor relations certificate program	23
Industrial education	26
Industrial engineering technology	20, 44
Industrial management	34, 44
Insurance	8
Machine design certificate program	23
Mathematics	33, 45
Mechanical engineering technology	21, 39
Nonresident admission	6
Officers of administration and instruction	4
Out-of-state applicants	6
Philosophy	47
Physical education for men	31
Physical education for women	30, 47
Physical sciences	47
Physics	47
Plans of study	
Agriculture	34
agricultural engineering	35
agricultural science	35
biochemistry	35
food technology	36
forestry and conservation	36
general option	35
preveterinary science and medicine	36
Applied Technology	19
architectural engineering technology	19
certificate programs	22
industrial engineering technology	20
mechanical engineering technology	21
Engineering	14
freshman	18
Home Economics	37
Humanities, Social Science, and Education	26
areas of concentration	27
audiology and speech sciences	31
elementary education	29
general program, B.A.	29
physical education for men	31
physical education for women	30
psychology	31
Industrial education	31
Industrial management	26
Science	34
biological sciences	32
chemistry	33, 34
general program, B.S.	31
physics	33
prepharmacy	33
Prepharmacy	33
Preveterinary science and medicine	36
Probation, scholastic	10
Probation index	11
Professional foremanship certificate program	24
Psychology	31, 48
Refunds	8
Registration	7
Requirements, admission	5
Semester index	9
Scholarship indexes	9
Scholastic probation	10
Science, School of	31
Sociology	48
Spanish	49
Speech	49
Staff	50
Superior students	12
Temporary students	7
Tool design certificate program	25
Transfer students	6
University Extension Council	IBC
University fees	7
Withdrawal	8

UNIVERSITY EXTENSION COUNCIL

1963-1964

Ex-Officio

C. H. LAWSHE, Ph.D.	Dean of University Extension
D. A. SCOTT, Ph.D.	Associate Dean of University Extension
K. M. MICHELS, Ph.D.	Assistant Dean of University Extension
R. L. EWIGLEBEN, Ed.D.	Director of Ft. Wayne Center
E. L. BUTZ, Ph.D.	Dean of Agriculture
H. G. DIESSLIN, Ph.D.	Associate Dean of Agriculture and Director of Cooperative Extension Service
L. O. NELSON, Ph.D.	Director of Conferences and Continuation Services
F. K. BURRIN, Ph.D.	Director of Summer Sessions and Evening Classes

Appointed by the President for One Year

D. B. DONER, Ph.D.	Associate Dean of the School of Humanities, Social Science, and Education
R. J. GROSH, Ph.D.	Head of the School of Mechanical Engineering
W. E. MARTIN, Ph.D.	Head of the Department of Child Development and Family Life
A. M. REMPEL, Ph.D.	Acting Head of the Department of Education
M. M. SNODGRASS, Ph.D.	Associate Professor of Agricultural Economics
H. H. YOUNG, M.S.I.Eng.	Professor of Industrial Engineering

Appointed by the President for Two Years

RUSSELL COSPER, Ph.D.	Head of the Department of English
W. O. FORSTER, Ph.D.	Head of the Department of History, Government, and Philosophy
FELIX HAAS, Ph.D.	Dean of the School of Science
H. C. ROUNTREE, B.S.I.E.	Head of Department of Engineering Technology
E. C. STEVENSON, Ph.D.	Head of the Department of Horticulture
D. H. WALTHER, Ph.D.	Head of the Department of Modern Languages

Appointed by the President for Three Years

RALPH G. BEELKE, Ph.D.	Head of the Department of Art and Design
MARY FUQUA, Ph.D.	Head of the Department of Foods and Nutrition
WILLIAM H. HAYT, JR., Ph.D.	Head of the School of Electrical Engineering
J. L. KRIDER, Ph.D.	Head of Department of Animal Sciences
E. WM. NOLAND, Ph.D.	Head of the Department of Sociology
MAX D. STEER, Ph.D.	Head of the Department of Audiology and Speech Science

Purdue-Barker Center

631 Washington Street

Michigan City, Indiana

Return Requested

NON-PROFIT ORGANIZATION

